ATTACHMENT A

Flow Frequency Analysis

MEMORANDUM

DEPARTMENT OF ENVIRONMENTAL QUALITY
Piedmont Regional Office
4949-A Cox Road Glen Allen, Virginia 23060

SUBJECT: Flow Frequency Determination / 303(d) Status
Addison-Evans Water Treatment Plant – VA0006254

TO: Brian Wrenn

FROM: Jennifer Palmore, P.G.

DATE: January 7, 2016

COPIES: File

The Addison-Evans Water Production and Laboratory facility (WTP) is located near Brandermill in Chesterfield County. The facility discharges to Swift Creek directly below the Swift Creek Reservoir dam at rivermile 2DSFT030.73. Flow frequencies have been requested for use in developing effluent limitations for the VPDES permit.

Swift Creek Reservoir is operated as a public water supply reservoir. Due to the withdrawals by Chesterfield County and an agreement between the county and the landowners immediately adjacent to Swift Creek Reservoir, Swift Creek has the potential to go dry immediately downstream of the reservoir during periods of low flow. The flow frequencies are presented below.

Swift Creek at discharge point
Drainage Area = 65 mi^2

1Q30 = 0.0 cfs	High Flow 1Q10 = 0.0 cfs
1Q10 = 0.0 cfs	High Flow 7Q10 = 0.0 cfs
7Q10 = 0.0 cfs	High Flow 30Q10 = 0.0 cfs
30Q10 = 0.0 cfs	HM = 0.0 cfs
30Q5 = 0.0 cfs	

This analysis does not address any other withdrawals, discharges, or springs.

Due to the lack of release from the dam during low flow events, the stream s considered a Tier 1 water at the vicinity of the outfall. Effluent data should be used to characterize the stream during critical low-flow conditions.

During the 2012 and draft 2014 305(b)/303(d) Water Quality Integrated Reports, Swift Creek from the Swift Creek Reservoir dam downstream to Reedy Creek was assessed as a Category 5A water ("A Water Quality Standard is not attained. The water is impaired or threatened for one or more designated uses by a pollutant(s) and requires a TMDL (303d list).") The applicable fact sheets are attached. The Aquatic Life Use is impaired due to dissolved oxygen exceedances. The Wildlife Use was fully supporting and the Recreation- and Fish Consumption Uses were not assessed.

Swift Creek is located within the study area for the Appomattox River Basin Bacterial TMDL, which was approved by the EPA on 8/30/2004 and by the SWCB on 12/20/2005. The facility originally received an E. coli wasteload allocation of 1.05E+10 cfu/year. However, that was subsequently determined to be an

error as the water treatment plant is not expected to be a source of additional fecal bacteria. The TMDL was modified on 2/2/2011 to remove the wasteload allocation.

The Chesapeake Bay TMDL, which was approved by the EPA on 12/29/2010, allocates loads for total nitrogen, total phosphorus, and total suspended solids to protect the dissolved oxygen and submerged aquatic vegetation acreage criteria in the Chesapeake Bay and its tidal tributaries. Unfortunately, the Addison-Evans WTP was inadvertently excluded from the aggregated loads for non-significant wastewater dischargers in the Appomattox River tidal freshwater estuary (APPTF). Before the permit can be reissued, we need to confirm that there is available reserve capacity to allow issuance of the permit. The nutrient allocations are administered through the Watershed Nutrient General Permit; the TSS allocations are considered aggregated and facilities with technology-based TSS limits are considered to be in conformance with the TMDL.

If you have any questions concerning this analysis, please let me know.

2012 Fact Sheets for 303(d) Waters

RIVER BASIN: James River Basin **HYDROLOGIC UNIT:** 02080207

STREAM NAME: **Swift Creek**

TMDL ID: **J17R-08-DO** **2012 IMPAIRED AREA ID:** VAP-J17R-08

ASSESSMENT CATEGORY: 5A **TMDL DUE DATE:** 2022

IMPAIRED SIZE: 3.67 - Miles **Watershed:** VAP-J17R

INITIAL LISTING: 2010

UPSTREAM LIMIT: Swift Creek Reservoir dam

DOWNSTREAM LIMIT: Reedy Creek

Swift Creek from the Swift Creek Reservoir dam downstream to its confluence with Reedy Creek.

CLEAN WATER ACT GOAL AND USE SUPPORT:

Aquatic Life Use - Not Supporting

IMPAIRMENT: Dissolved Oxygen

For the 2010 cycle 2 DEQ stations were added and both stations were impaired for DO.

For the 2012 cycle the segment still remains impaired for DO and there has been no new data since 2010 cycle.

IMPAIRMENT SOURCE: Impoundment

The source of the DO is suspected to be low flows released from dams in the summer and fall.

RECOMMENDATION: Standards Change

2014 Fact Sheets for 303(d) Waters

RIVER BASIN: James River Basin **HYDROLOGIC UNIT:** 02080207

STREAM NAME: **Swift Creek**

TMDL ID: **J17R-08-DO** **2014 Impaired Area ID:** VAP-J17R-08

ASSESSMENT CATEGORY: 5A **TMDL DUE DATE:** 2022

IMPAIRED SIZE: 3.78 - Miles **Watershed:** VAP-J17R

INITIAL LISTING: 2010

UPSTREAM LIMIT: Swift Creek Reservoir dam

DOWNSTREAM LIMIT: Reedy Creek

Swift Creek from the Swift Creek Reservoir dam downstream to its confluence with Reedy Creek.

CLEAN WATER ACT GOAL AND USE SUPPORT:

Aquatic Life Use - Not Supporting

IMPAIRMENT: Dissolved Oxygen

For the 2010 cycle 2 DEQ stations (2-SFT030.65, 2-SFT027.38) were added and both stations were impaired for aquatic life use for DO.

there has been no new data since 2010 cycle.

IMPAIRMENT SOURCE Impoundment

The source of the DO is suspected to be low flows released from dams in the summer and fall.

RECOMMENDATION: Standards Change

ATTACHMENT B

Site Visit Report

MEMORANDUM

DEPARTMENT OF ENVIRONMENTAL QUALITY
Piedmont Regional Office

4949-A Cox Road **Glen Allen, VA 23060** **804/527-5020**

SUBJECT: Site Visit - VA0006254, Addison-Evans Water Production and Laboratory

DATE: December 29, 2015

On December 14, 2015, staff from the DEQ Piedmont Regional Office visited the Addison-Evans Water Production and Laboratory in Chesterfield County, Virginia. The visit consisted of a review of the water treatment plant and wastewater treatment system, groundwater monitoring wells, and the outfall. The WTP uses settling, filtration, and chlorination to treat the raw water to drinking water standards. Wastewater generated from the water treatment process includes settling basin solids (approximately 0.1 MGD) and backwash water (approximately 0.4 MGD) from the anthracite filters. The wastewater is stored in a three-cell sludge lagoon. Currently, only two of the three cells are functional. The functioning cells have floating agitators that create a slurry of the backwash water and the settled solids. The slurry is pumped out and sent to the Proctors Creek WWTP. Due to pipe capacity issues, the slurry is pumped out from two separate points. The main pump out is to a sewer connection immediately adjacent to the lagoon. The other pump out consists of a green flex hose run to two separate manholes that are part of the collection system to Proctors Creek WWTP. Each pump station has a separate float system to automatically initiate pumping.

Overall, the WTP appears to be well run and maintained. The above-ground settling basins have undergone extensive repair to seal leaks and cracks. The facility is continuing to repair cracks/leaks as needed. Outside above-ground storage tanks are double-walled or have containment systems to prevent discharges should a leak or spill occur. Additional chemical storage for orthophosphate is located inside and not exposed to weather events. The green flex hose conveying wastewater to the manholes appeared to be in good condition. Solids were cleaned out of the sludge lagoon in 2012. It is not anticipated that clean out of the lagoon will be necessary in the next permit cycle. A back-up generator is located on site and is tested under load on a weekly basis.

The facility has five groundwater monitoring wells on site. The original upgradient or background well (MW-3) was converted to a compliance well and a new background well (MW-4) was installed. Historically, MW-3 and MW-5 have shown the greatest difference above the background well.

Above-ground Settling Basins and MW-3

Sludge Lagoon with WTP in Background

Sludge Lagoon at Pump Out with Green Flex Hose

Green Flex Hose Going to Manholes

Main Pump Out and Float System

MW-1

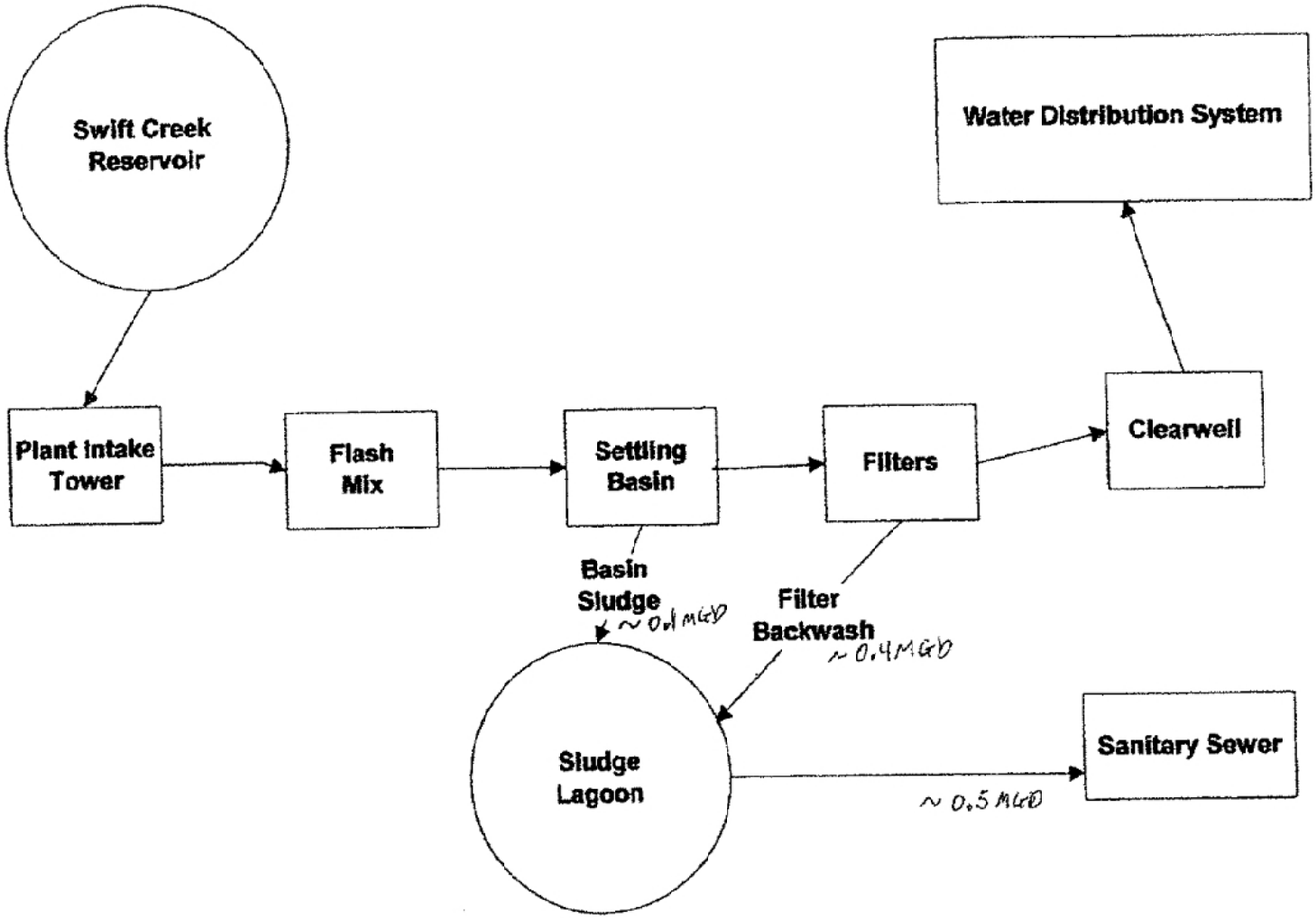
MW-4

MW-5

ATTACHMENT C

Plant Flow Diagram

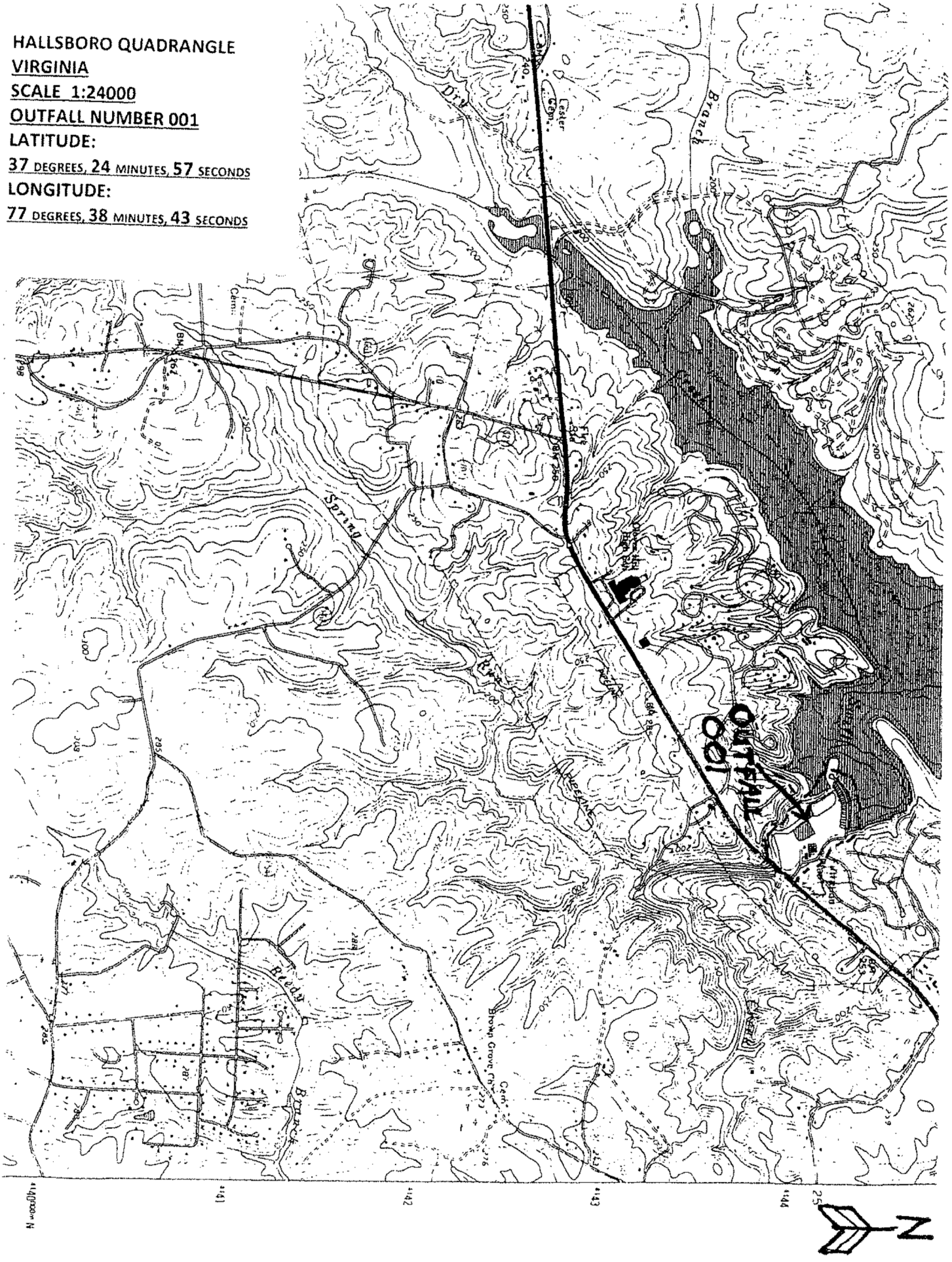
ADDISON/EVANS WATER PRODUCTION AND LABORATORY FACILITY



ATTACHMENT D

Topographic Map

HALLSBORO QUADRANGLE
VIRGINIA
SCALE 1:24000
OUTFALL NUMBER 001
LATITUDE:
37 DEGREES, 24 MINUTES, 57 SECONDS
LONGITUDE:
77 DEGREES, 38 MINUTES, 43 SECONDS



ATTACHMENT E

Permit Application and Certified Effluent Data (08/25/2010)

PLEASE PRINT OR TYPE IN THE UNSHADED AREAS ONLY. You may report some or all of this information on separate sheets (*use the same format*) instead of completing these pages. SEE INSTRUCTIONS.

EPA I.D. NUMBER (*copy from Item 1 of Form 1*): VA 0006254

V. INTAKE AND EFFLUENT CHARACTERISTICS (*continued from page 3 of Form 2-C*)

OUTFALL NO. 001

PART A –You must provide the results of at least one analysis for every pollutant in this table. Complete one table for each outfall. See instructions for additional details.

1. POLLUTANT	2. EFFLUENT							3. UNITS (*specify if blank*)		4. INTAKE (*optional*)		
	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE (*if available*)		c. LONG TERM AVRG. VALUE (*if available*)		d. NO. OF ANALYSES	a. CONCENTRATION	b. MASS	a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
a. Biochemical Oxygen Demand (*BOD*)												
b. Chemical Oxygen Demand (*COD*)												
c. Total Organic Carbon (*TOC*)												
d. Total Suspended Solids (*TSS*)												
e. Ammonia (*as N*)												
f. Flow	VALUE		VALUE		VALUE					VALUE		
g. Temperature (*winter*)	VALUE		VALUE		VALUE			°C		VALUE		
h. Temperature (*summer*)	VALUE		VALUE		VALUE			°C		VALUE		
i. pH	MINIMUM	MAXIMUM	MINIMUM	MAXIMUM				STANDARD UNITS				

PART B – Mark "X" in column 2-a for each pollutant you know or have reason to believe is present. Mark "X" in column 2-b for each pollutant you believe to be absent. If you mark column 2a for any pollutant which is limited either directly, or indirectly but expressly, in an effluent limitations guideline, you must provide the results of at least one analysis for that pollutant. For other pollutants for which you mark column 2a, you must provide quantitative data or an explanation of their presence in your discharge. Complete one table for each outfall. See the instructions for additional details and requirements.

1. POLLUTANT AND CAS NO. (*if available*)	2. MARK "X"		3. EFFLUENT							4. UNITS		5. INTAKE (*optional*)		
	a. BELIEVED PRESENT	b. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE (*if available*)		c. LONG TERM AVRG. VALUE (*if available*)		d. NO. OF ANALYSES	a. CONCENTRATION	b. MASS	a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
			(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
a. Bromide (24959-67-9)														
b. Chlorine, Total Residual														
c. Color														
d. Fecal Coliform														
e. Fluoride (16984-48-8)														
f. Nitrate-Nitrite (*as N*)														

Note: Previous data is certified as being representative.

ITEM V-B CONTINUED FROM FRONT

1. POLLUTANT AND CAS NO. (*if available*)	2. MARK "X"		3. EFFLUENT							4. UNITS		5. INTAKE (*optional*)		
	a. BELIEVED PRESENT	b. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE (*if available*)		c. LONG TERM AVRG. VALUE (*if available*)		d. NO. OF ANALYSES	a. CONCENTRATION	b. MASS	a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
			(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
g. Nitrogen, Total Organic (*as N*)														
h. Oil and Grease														
i. Phosphorus (as P), Total (7723-14-0)														
j. Radioactivity														
(1) Alpha, Total														
(2) Beta, Total														
(3) Radium, Total														
(4) Radium 226, Total														
k. Sulfate (*as SO_4*) (14808-79-8)														
l. Sulfide (*as S*)														
m. Sulfite (*as SO_3*) (14265-45-3)														
n. Surfactants														
o. Aluminum, Total (7429-90-5)														
p. Barium, Total (7440-39-3)														
q. Boron, Total (7440-42-8)														
r. Cobalt, Total (7440-48-4)														
s. Iron, Total (7439-89-6)														
t. Magnesium, Total (7439-95-4)														
u. Molybdenum, Total (7439-98-7)														
v. Manganese, Total (7439-96-5)														
w. Tin, Total (7440-31-5)														
x. Titanium, Total (7440-32-6)														

Note: Previous data is certified as being representative.

EPA I.D NUMBER (*copy from Item 1 of Form 1*)	OUTFALL NUMBER

CONTINUED FROM PAGE 3 OF FORM 2-C

PART C - If you are a primary industry and this outfall contains process wastewater, refer to Table 2c-2 in the instructions to determine which of the GC/MS fractions you must test for. Mark "X" in column 2-a for all such GC/MS fractions that apply to your industry and for ALL toxic metals, cyanides, and total phenols. If you are not required to mark column 2-a (*secondary industries, nonprocess wastewater outfalls, and nonrequired GC/MS fractions*), mark "X" in column 2-b for each pollutant you know or have reason to believe is present. Mark "X" in column 2-c for each pollutant you believe is absent. If you mark column 2a for any pollutant, you must provide the results of at least one analysis for that pollutant. If you mark column 2b for any pollutant, you must provide the results of at least one analysis for that pollutant if you know or have reason to believe it will be discharged in concentrations of 10 ppb or greater. If you mark column 2b for acrolein, acrylonitrile, 2,4 dinitrophenol, or 2-methyl-4, 6 dinitrophenol, you must provide the results of at least one analysis for each of these pollutants which you know or have reason to believe that you discharge in concentrations of 100 ppb or greater. Otherwise, for pollutants for which you mark column 2b, you must either submit at least one analysis or briefly describe the reasons the pollutant is expected to be discharged. Note that there are 7 pages to this part; please review each carefully. Complete one table (*all 7 pages*) for each outfall. See instructions for additional details and requirements.

1. POLLUTANT AND CAS NUMBER (*if available*)	2. MARK "X"			3. EFFLUENT							4. UNITS		5. INTAKE (*optional*)		
	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE (*if available*)		c. LONG TERM AVRG VALUE (*if available*)		d. NO. OF ANALYSES	a. CONCENTRATION	b. MASS	a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
METALS, CYANIDE, AND TOTAL PHENOLS															
1M. Antimony, Total (7440-36-0)															
2M. Arsenic, Total (7440-38-2)															
3M. Beryllium, Total (7440-41-7)															
4M. Cadmium, Total (7440-43-9)															
5M. Chromium, Total (7440-47-3)															
6M. Copper, Total (7440-50-8)															
7M. Lead, Total (7439-92-1)															
8M. Mercury, Total (7439-97-6)															
9M. Nickel, Total (7440-02-0)															
10M. Selenium, Total (7782-49-2)															
11M. Silver, Total (7440-22-4)															
12M. Thallium, Total (7440-28-0)															
13M. Zinc, Total (7440-66-6)															
14M. Cyanide, Total (57-12-5)															
15M. Phenols, Total															
DIOXIN															
2,3,7,8-Tetrachlorodibenzo-P-Dioxin (1764-01-6)				DESCRIBE RESULTS											

Note: Previous data is certified as being representative.

CONTINUED FROM THE FRONT

1. POLLUTANT AND CAS NUMBER (*if available*)	2. MARK "X"			3. EFFLUENT							4. UNITS		5. INTAKE (*optional*)		
	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE (*if available*)		c. LONG TERM AVRG. VALUE (*if available*)		d. NO. OF ANALYSES	a. CONCENTRATION	b. MASS	a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
GC/MS FRACTION – VOLATILE COMPOUNDS															
1V. Acrolein (107-02-8)															
2V. Acrylonitrile (107-13-1)															
3V. Benzene (71-43-2)															
4V. Bis (*Chloromethyl*) Ether (542-88-1)				*DELISTED 02-4-1981* ANALYSIS NOT REQUIRED FOR THIS PARAMETER											
5V. Bromoform (75-25-2)															
6V. Carbon Tetrachloride (56-23-5)															
7V. Chlorobenzene (108-90-7)															
8V. Chlorodibromomethane (124-48-1)															
9V. Chloroethane (75-00-3)															
10V. 2-Chloroethylvinyl Ether (110-75-8)															
11V. Chloroform (67-66-3)															
12V. Dichlorobromomethane (75-27-4)															
13V. Dichlorodifluoromethane (75-71-8)				*DELISTED 01-8-1981* ANALYSIS NOT REQUIRED FOR THIS PARAMETER											
14V. 1,1-Dichloroethane (75-34-3)															
15V. 1,2-Dichloroethane (107-06-2)															
16V. 1,1-Dichloroethylene (75-35-4)															
17V. 1,2-Dichloropropane (78-87-5)															
18V. 1,3-Dichloropropylene (542-75-6)															
19V. Ethylbenzene (100-41-4)															
20V. Methyl Bromide (74-83-9)															
21V. Methyl Chloride (74-87-3)															

Note: Previous data is certified as being representative.

CONTINUED FROM PAGE V-4

1. POLLUTANT AND CAS NUMBER (*if available*)	2. MARK "X"			3. EFFLUENT							4. UNITS		5. INTAKE (*optional*)		
	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE (*if available*)		c. LONG TERM AVRG. VALUE (*if available*)		d. NO. OF ANALYSES	a. CONCENTRATION	b. MASS	a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
GC/MS FRACTION – VOLATILE COMPOUNDS (*continued*)															
22V. Methylene Chloride (75-09-2)															
23V. 1,1,2,2-Tetrachloroethane (79-34-5)															
24V. Tetrachloroethylene (127-18-4)															
25V. Toluene (108-88-3)															
26V. 1,2-Trans-Dichloroethylene (156-60-5)															
27V. 1,1,1-Trichloroethane (71-55-6)															
28V. 1,1,2-Trichloroethane (79-00-5)															
29V Trichloroethylene (79-01-6)															
30V. Trichlorofluoromethane (75-69-4)				*DELISTED 01-8-1981* ANALYSIS NOT REQUIRED FOR THIS PARAMETER											
31V. Vinyl Chloride (75-01-4)															
GC/MS FRACTION – ACID COMPOUNDS															
1A. 2-Chlorophenol (95-57-8)															
2A. 2,4-Dichlorophenol (120-83-2)															
3A. 2,4-Dimethylphenol (105-67-9)															
4A. 4,6-Dinitro-O-Cresol (534-52-1)															
5A. 2,4-Dinitrophenol (51-28-5)															
6A. 2-Nitrophenol (88-75-5)															
7A. 4-Nitrophenol (100-02-7)															
8A. P-Chloro-M-Cresol (59-50-7)															
9A. Pentachlorophenol (87-86-5)															
10A. Phenol (108-95-2)															
11A. 2,4,6-Trichlorophenol (88-05-2)															

Note: Previous data is certified as being representative.

CONTINUED FROM THE FRONT

1. POLLUTANT AND CAS NUMBER (*if available*)	2. MARK "X"			3. EFFLUENT							4. UNITS		5. INTAKE (*optional*)		
	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE (*if available*)		c. LONG TERM AVRG. VALUE (*if available*)		d. NO. OF ANALYSES	a. CONCENTRATION	b. MASS	a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
GC/MS FRACTION – BASE/NEUTRAL COMPOUNDS															
1B. Acenaphthene (83-32-9)															
2B. Acenaphtylene (208-96-8)															
3B. Anthracene (120-12-7)															
4B. Benzidine (92-87-5)															
5B. Benzo (*a*) Anthracene (56-55-3)															
6B. Benzo (*a*) Pyrene (50-32-8)															
7B. 3,4-Benzo-fluoranthene (205-99-2)															
8B. Benzo (*ghi*) Perylene (191-24-2)															
9B. Benzo (*k*) Fluoranthene (207-08-9)															
10B. Bis (*2-Chloro-ethoxy*) Methane (111-91-1)															
11B. Bis (*2-Chloro-ethyl*) Ether (111-44-4)															
12B. Bis (*2-Chloroisopropyl*) Ether (102-80-1)															
13B. Bis (*2-Ethyl-hexyl*) Phthalate (117-81-7)															
14B. 4-Bromophenyl Phenyl Ether (101-55-3)															
15B. Butyl Benzyl Phthalate (85-68-7)															
16B. 2-Chloro-naphthalene (91-58-7)															
17B. 4-Chloro-phenyl Phenyl Ether (7005-72-3)															
18B. Chrysene (218-01-9)															
19B. Dibenzo (*a,h*) Anthracene (53-70-3)															
20B. 1,2-Dichloro-benzene (95-50-1)															
21B. 1,3-Di-chloro-benzene (541-73-1)															

Note: Previous data is certified as being representative.

CONTINUED FROM PAGE V-6

1. POLLUTANT AND CAS NUMBER (*if available*)	2. MARK "X"			3. EFFLUENT							4. UNITS		5. INTAKE (*optional*)		
	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE (*if available*)		c. LONG TERM AVRG. VALUE (*if available*)		d. NO. OF ANALYSES	a. CONCENTRATION	b. MASS	a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
GC/MS FRACTION – BASE/NEUTRAL COMPOUNDS (*continued*)															
22B. 1,4-Dichlorobenzene (106-46-7)															
23B. 3,3-Dichlorobenzidine (91-94-1)															
24B. Diethyl Phthalate (84-66-2)															
25B. Dimethyl Phthalate (131-11-3)															
26B. Di-N-Butyl Phthalate (84-74-2)															
27B. 2,4-Dinitrotoluene (121-14-2)															
28B. 2,6-Dinitrotoluene (606-20-2)															
29B. Di-N-Octyl Phthalate (117-84-0)															
30B. 1,2-Diphenylhydrazine (*as Azobenzene*) (122-66-7)															
31B. Fluoranthene (206-44-0)															
32B. Fluorene (86-73-7)															
33B. Hexachlorobenzene (118-74-1)															
34B. Hexachlorobutadiene (87-68-3)															
35B. Hexachlorocyclopentadiene (77-47-4)															
36B Hexachloroethane (67-72-1)															
37B. Indeno (1,2,3-cd) Pyrene (193-39-5)															
38B. Isophorone (78-59-1)															
39B. Naphthalene (91-20-3)															
40B. Nitrobenzene (98-95-3)															
41B. N-Nitrosodimethylamine (62-75-9)															
42B. N-Nitrosodi-N-Propylamine (621-64-7)															

Note: Previous data is certified as being representative.

CONTINUED FROM THE FRONT

1. POLLUTANT AND CAS NUMBER (*if available*)	2. MARK "X"			3. EFFLUENT							4. UNITS		5. INTAKE (*optional*)		
	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE (*if available*)		c. LONG TERM AVRG. VALUE (*if available*)		d. NO. OF ANALYSES	a. CONCEN-TRATION	b. MASS	a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
GC/MS FRACTION – BASE/NEUTRAL COMPOUNDS (*continued*)															
43B. N-Nitro-sodiphenylamine (86-30-6)															
44B. Phenanthrene (85-01-8)															
45B. Pyrene (129-00-0)															
46B. 1,2,4-Tri-chlorobenzene (120-82-1)															
GC/MS FRACTION – PESTICIDES															
1P. Aldrin (309-00-2)															
2P. α-BHC (319-84-6)															
3P. β-BHC (319-85-7)															
4P. γ-BHC (58-89-9)															
5P. δ-BHC (319-86-8)															
6P. Chlordane (57-74-9)															
7P. 4,4'-DDT (50-29-3)															
8P. 4,4'-DDE (72-55-9)															
9P. 4,4'-DDD (72-54-8)															
10P. Dieldrin (60-57-1)															
11P. α-Enosulfan (115-29-7)															
12P. β-Endosulfan (115-29-7)															
13P. Endosulfan Sulfate (1031-07-8)															
14P. Endrin (72-20-8)															
15P. Endrin Aldehyde (7421-93-4)															
16P. Heptachlor (76-44-8)															

Note: Previous data is certified as being representative.

EPA I.D. NUMBER (*copy from Item 1 of Form 1*)	OUTFALL NUMBER

CONTINUED FROM PAGE V-8

1. POLLUTANT AND CAS NUMBER (*if available*)	2. MARK "X"			3. EFFLUENT							4. UNITS		5. INTAKE (*optional*)		
	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE (*If available*)		c. LONG TERM AVRG. VALUE (*If available*)		d. NO. OF ANALYSES	a. CONCENTRATION	b. MASS	a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
GC/MS FRACTION – PESTICIDES (*continued*)															
17P. Heptechlor Epoxide (1024-57-3)															
18P. PCB-1242 (53469-21-9)															
19P. PCB-1254 (11097-69-1)															
20P. PCB-1221 (11104-28-2)															
21P. PCB-1232 (11141-16-5)															
22P. PCB-1248 (12672-29-6)															
23P. PCB-1260 (11096-82-5)															
24P. PCB-1016 (12674-11-2)															
25P. Toxaphene (8001-35-2)															

Note: Previous data is certified as being representative.

Created 10/02/12 DJS

Waste Disposal from the Backwash & Basins Sludge Lagoon

1.1 General Operation

Daily backwash of 4 high-rate filters (3 million gallons/day (mgd) each), and sludge removal from sedimentation basins, adds approximately 0.5 mgd of waste to our lagoon. Two *Myers* solids handling pumps with 4-inch discharge are located in a wet well to send waste from the lagoon to the domestic sewer system. The pumps are operated by float/mercury switches and each pump has a maximum capacity of 720 gallons/minute (gpm); the pumps are most often operated as one pump at a time. If pump/wet well malfunctions occur, two 6-inch permanent ports leading to pipe feeding the domestic sewer system have been set up for use with a large portable pump. This capability adds an extra buffer to prevent discharge from the lagoon. [Note: No discharges have been made in the 24 years we have maintained this inactive permit. No discharge is planned; the permit is maintained in case of unforeseen events.]

1.2 Long-term Waste Disposal

Sludge solids will build up in the lagoon over time. Occasionally sludge will need to be removed to ensure proper volume is provided for the constant stream of new waste. This procedure is an infrequent occurrence; the most recent removal of solids was 21 years after the last needed large scale sludge removal. Vendors will be given specifications ensuring all Department of Environmental Quality (DEQ) regulations and concerns are met in removal and final disposal of the built-up sludge. Vendors who meet DEQ concerns will submit plans that may include on-site thickening (e.g. belt press) or direct pumping of solids. Final disposal may include addition of the sludge to a landfill or land application.

All plans found to be in accordance with DEQ/EPA regulations will be considered and cost may be a final determining factor. [For example, the most recent disposal included a DEQ-approved plan of direct pumping of solids to tanker trucks followed by land application. A second vendor had bid for solids thickening and disposal in a landfill at approximately twice the cost and twice the time to complete.] Daily project management for such projects include; minimization of sludge disposal effect on normal operations, logistics for trucks and large equipment on property, ensuring proper sludge removal, ensuring non-existent environmental effect, minimization of impact on surrounding local residents, and verifying appropriate final disposal of solids.

Monitoring Data from August 25, 2010 VPDES Permit Application

PLEASE PRINT OR TYPE IN THE UNSHADED AREAS ONLY. You may report some or all of this information on separate sheets (*use the same format*) instead of completing these pages. SEE INSTRUCTIONS.

EPA I.D. NUMBER (*copy from Item 1 of Form 1*): VA 0006254

V. INTAKE AND EFFLUENT CHARACTERISTICS (*continued from page 3 of Form 2-C*)

OUTFALL NO. 001

PART A –You must provide the results of at least one analysis for every pollutant in this table. Complete one table for each outfall. See instructions for additional details.

1. POLLUTANT	2. EFFLUENT						d. NO. OF ANALYSES	3. UNITS (*specify if blank*)		4. INTAKE (*optional*)		
	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE (*if available*)		c. LONG TERM AVRG. VALUE (*if available*)			a. CONCEN-TRATION	b. MASS	a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
a. Biochemical Oxygen Demand (*BOD*)	<3	<12.51					1	MG/L	Pounds			
b. Chemical Oxygen Demand (*COD*)	28	116.8					1	MG/L	Pounds			
c. Total Organic Carbon (*TOC*)	11	45.87					1	MG/L	Pounds			
d. Total Suspended Solids (*TSS*)	80	333.6					1	MG/L	Pounds			
e. Ammonia (*as N*)	0.45	1.67					1	MG/L	Pounds			
f. Flow	VALUE 0.5		VALUE		VALUE		1	MGD		VALUE		
g. Temperature (*winter*)	VALUE 4		VALUE		VALUE		1	°C		VALUE		
h. Temperature (*summer*)	VALUE 29.7		VALUE		VALUE		1	°C		VALUE		
i. pH	MINIMUM 6.3	MAXIMUM 6.3	MINIMUM	MAXIMUM			1	STANDARD UNITS				

PART B – Mark "X" in column 2-a for each pollutant you know or have reason to believe is present. Mark "X" in column 2-b for each pollutant you believe to be absent. If you mark column 2a for any pollutant which is limited either directly, or indirectly but expressly, in an effluent limitations guideline, you must provide the results of at least one analysis for that pollutant. For other pollutants for which you mark column 2a, you must provide quantitative data or an explanation of their presence in your discharge. Complete one table for each outfall. See the instructions for additional details and requirements.

1. POLLUTANT AND CAS NO. (*if available*)	2. MARK "X"		3. EFFLUENT						d. NO. OF ANALYSES	4. UNITS		5. INTAKE (*optional*)		
	a. BELIEVED PRESENT	b. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE (*if available*)		c. LONG TERM AVRG. VALUE (*if available*)			a. CONCEN-TRATION	b. MASS	a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
			(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
a. Bromide (24959-67-9)		X												
b. Chlorine, Total Residual	X		0.01	0.04					1	MG/L	Pound			
c. Color	X		80						1	ACU	N/A			
d. Fecal Coliform	X		50	946,250					1	MPN/100M	MPN			
e. Fluoride (16984-48-8)	X		0.94	3.92					1	MG/L	Pound			
f. Nitrate-Nitrite (as *N*)	X		<0.1	<0.42					1	MG/L	Pound			

ITEM V-B CONTINUED FROM FRONT

1. POLLUTANT AND CAS NO. (*if available*)	2. MARK "X"		3. EFFLUENT							4. UNITS		5. INTAKE (*optional*)		
	a. BELIEVED PRESENT	b. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE (*if available*)		c. LONG TERM AVRG. VALUE (*if available*)		d. NO. OF ANALYSES	a. CONCENTRATION	b. MASS	a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
			(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
g. Nitrogen, Total Organic (*as N*)	X		0.59	2.46					1	MG/L	Pound			
h. Oil and Grease		X												
i. Phosphorus (as P), Total (7723-14-0)	X		0.048	0.20					1	MG/L	Pound			
j. Radioactivity														
(1) Alpha, Total		X												
(2) Beta, Total		X												
(3) Radium, Total		X												
(4) Radium 226, Total		X												
k. Sulfate (*as SO_4*) (14808-79-8)	X		38	158.5					1	Mg/L	Pound			
l. Sulfide (*as S*)		X												
m. Sulfite (*as SO_3*) (14265-45-3)		X												
n. Surfactants		X												
o. Aluminum, Total (7429-90-5)	X		0.046	0.19					1	MG/L	Pound			
p. Barium, Total (7440-39-3)		X												
q. Boron, Total (7440-42-8)		X												
r. Cobalt, Total (7440-48-4)		X												
s. Iron, Total (7439-89-6)	X		4.3	17.93					1	MG/L	Pound			
t. Magnesium, Total (7439-95-4)		X												
u. Molybdenum, Total (7439-98-7)		X												
v. Manganese, Total (7439-96-5)	X		0.68	2.84					1	MG/L	Pound			
w. Tin, Total (7440-31-5)		X												
x. Titanium, Total (7440-32-6)		X												

CONTINUE ON PAGE V-3

EPA I.D. NUMBER (*copy from Item 1 of Form 1*)	OUTFALL NUMBER
VA 0006254	001

CONTINUED FROM PAGE 3 OF FORM 2-C

PART C - If you are a primary industry and this outfall contains process wastewater, refer to Table 2c-2 in the instructions to determine which of the GC/MS fractions you must test for. Mark "X" in column 2-a for all such GC/MS fractions that apply to your industry and for ALL toxic metals, cyanides, and total phenols. If you are not required to mark column 2-a (*secondary industries, nonprocess wastewater outfalls, and nonrequired GC/MS fractions*), mark "X" in column 2-b for each pollutant you know or have reason to believe is present. Mark "X" in column 2-c for each pollutant you believe is absent. If you mark column 2a for any pollutant, you must provide the results of at least one analysis for that pollutant. If you mark column 2b for any pollutant, you must provide the results of at least one analysis for that pollutant if you know or have reason to believe it will be discharged in concentrations of 10 ppb or greater. If you mark column 2b for acrolein, acrylonitrile, 2,4 dinitrophenol, or 2-methyl-4, 6 dinitrophenol, you must provide the results of at least one analysis for each of these pollutants which you know or have reason to believe that you discharge in concentrations of 100 ppb or greater. Otherwise, for pollutants for which you mark column 2b, you must either submit at least one analysis or briefly describe the reasons the pollutant is expected to be discharged. Note that there are 7 pages to this part; please review each carefully. Complete one table (*all 7 pages*) for each outfall. See instructions for additional details and requirements.

1. POLLUTANT AND CAS NUMBER (*if available*)	2. MARK "X"			3. EFFLUENT							4. UNITS		5. INTAKE (*optional*)		
	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE (*if available*)		c. LONG TERM AVRG. VALUE (*if available*)		d. NO. OF ANALYSES	a. CONCENTRATION	b. MASS	a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
METALS, CYANIDE, AND TOTAL PHENOLS															
1M. Antimony, Total (7440-36-0)			X												
2M. Arsenic, Total (7440-38-2)			X												
3M. Beryllium, Total (7440-41-7)			X												
4M. Cadmium, Total (7440-43-9)			X												
5M. Chromium, Total (7440-47-3)			X												
6M. Copper, Total (7440-50-8)			X												
7M. Lead, Total (7439-92-1)			X												
8M. Mercury, Total (7439-97-6)			X												
9M. Nickel, Total (7440-02-0)			X												
10M. Selenium, Total (7782-49-2)			X												
11M. Silver, Total (7440-22-4)			X												
12M. Thallium, Total (7440-28-0)			X												
13M. Zinc, Total (7440-66-6)			X												
14M. Cyanide, Total (57-12-5)			X												
15M. Phenols, Total			X												
DIOXIN															
2,3,7,8-Tetra-chlorodibenzo-P-Dioxin (1764-01-6)			X	DESCRIBE RESULTS											

CONTINUED FROM THE FRONT

1. POLLUTANT AND CAS NUMBER (*if available*)	2. MARK "X"			3. EFFLUENT							4. UNITS		5. INTAKE (*optional*)		
	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE (*if available*)		c. LONG TERM AVRG. VALUE (*if available*)		d. NO. OF ANALYSES	a. CONCENTRATION	b. MASS	a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
GC/MS FRACTION – VOLATILE COMPOUNDS															
1V. Accrolein (107-02-8)			X												
2V. Acrylonitrile (107-13-1)			X												
3V. Benzene (71-43-2)			X												
4V. Bis (*Chloromethyl*) Ether (542-88-1)			X												
5V. Bromoform (75-25-2)			X												
6V. Carbon Tetrachloride (56-23-5)			X												
7V. Chlorobenzene (108-90-7)			X												
8V. Chlorodibromomethane (124-48-1)			X												
9V. Chloroethane (75-00-3)			X												
10V. 2-Chloroethylvinyl Ether (110-75-8)			X												
11V. Chloroform (67-66-3)			X												
12V. Dichlorobromomethane (75-27-4)			X												
13V. Dichlorodifluoromethane (75-71-8)			X												
14V. 1,1-Dichloroethane (75-34-3)			X												
15V. 1,2-Dichloroethane (107-06-2)			X												
16V. 1,1-Dichloroethylene (75-35-4)			X												
17V. 1,2-Dichloropropane (78-87-5)			X												
18V. 1,3-Dichloropropylene (542-75-6)			X												
19V. Ethylbenzene (100-41-4)			X												
20V. Methyl Bromide (74-83-9)			X												
21V. Methyl Chloride (74-87-3)			X												

CONTINUED FROM PAGE V-4

1. POLLUTANT AND CAS NUMBER (*if available*)	2. MARK "X"			3. EFFLUENT							4. UNITS		5. INTAKE (*optional*)		
	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE (*if available*)		c. LONG TERM AVRG. VALUE (*if available*)		d. NO. OF ANALYSES	a. CONCEN-TRATION	b. MASS	a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
GC/MS FRACTION – VOLATILE COMPOUNDS (*continued*)															
22V. Methylene Chloride (75-09-2)			X												
23V. 1,1,2,2-Tetrachloroethane (79-34-5)			X												
24V. Tetrachloro-ethylene (127-18-4)			X												
25V. Toluene (108-88-3)			X												
26V. 1,2-Trans-Dichloroethylene (156-60-5)			X												
27V. 1,1,1-Trichloro-ethane (71-55-6)			X												
28V. 1,1,2-Trichloro-ethane (79-00-5)			X												
29V Trichloro-ethylene (79-01-6)			X												
30V. Trichloro-fluoromethane (75-69-4)			X												
31V. Vinyl Chloride (75-01-4)			X												
GC/MS FRACTION – ACID COMPOUNDS															
1A. 2-Chlorophenol (95-57-8)			X												
2A. 2,4-Dichloro-phenol (120-83-2)			X												
3A. 2,4-Dimethyl-phenol (105-67-9)			X												
4A. 4,6-Dinitro-O-Cresol (534-52-1)			X												
5A. 2,4-Dinitro-phenol (51-28-5)			X												
6A. 2-Nitrophenol (88-75-5)			X												
7A. 4-Nitrophenol (100-02-7)			X												
8A. P-Chloro-M-Cresol (59-50-7)			X												
9A. Pentachloro-phenol (87-86-5)			X												
10A. Phenol (108-95-2)			X												
11A. 2,4,6-Trichloro-phenol (88-05-2)			X												

CONTINUED FROM THE FRONT

1. POLLUTANT AND CAS NUMBER (*if available*)	2. MARK "X"			3. EFFLUENT							4. UNITS		5. INTAKE (*optional*)		
	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE (*if available*)		c. LONG TERM AVRG. VALUE (*if available*)		d. NO. OF ANALYSES	a. CONCENTRATION	b. MASS	a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
GC/MS FRACTION – BASE/NEUTRAL COMPOUNDS															
1B. Acenaphthene (83-32-9)			X												
2B. Acenaphtylene (208-96-8)			X												
3B. Anthracene (120-12-7)			X												
4B. Benzidine (92-87-5)			X												
5B. Benzo (*a*) Anthracene (56-55-3)			X												
6B. Benzo (*a*) Pyrene (50-32-8)			X												
7B. 3,4-Benzo-fluoranthene (205-99-2)			X												
8B. Benzo (*ghi*) Perylene (191-24-2)			X												
9B. Benzo (*k*) Fluoranthene (207-08-9)			X												
10B. Bis (*2-Chloro-ethoxy*) Methane (111-91-1)			X												
11B. Bis (*2-Chloro-ethyl*) Ether (111-44-4)			X												
12B. Bis (*2-Chloroisopropyl*) Ether (102-80-1)			X												
13B. Bis (*2-Ethyl-hexyl*) Phthalate (117-81-7)			X												
14B. 4-Bromophenyl Phenyl Ether (101-55-3)			X												
15B. Butyl Benzyl Phthalate (85-68-7)			X												
16B. 2-Chloro-naphthalene (91-58-7)			X												
17B. 4-Chloro-phenyl Phenyl Ether (7005-72-3)			X												
18B. Chrysene (218-01-9)			X												
19B. Dibenzo (*a,h*) Anthracene (53-70-3)			X												
20B. 1,2-Dichloro-benzene (95-50-1)			X												
21B. 1,3-Di-chloro-benzene (541-73-1)			X												

CONTINUED FROM PAGE V-6

1. POLLUTANT AND CAS NUMBER (*if available*)	2. MARK "X"			3. EFFLUENT							4. UNITS		5. INTAKE (*optional*)		
	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE (*if available*)		c. LONG TERM AVRG. VALUE (*if available*)		d. NO. OF ANALYSES	a. CONCENTRATION	b. MASS	a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
GC/MS FRACTION – BASE/NEUTRAL COMPOUNDS (*continued*)															
22B. 1,4-Dichlorobenzene (106-46-7)			X												
23B. 3,3-Dichlorobenzidine (91-94-1)			X												
24B. Diethyl Phthalate (84-66-2)			X												
25B. Dimethyl Phthalate (131-11-3)			X												
26B. Di-N-Butyl Phthalate (84-74-2)			X												
27B. 2,4-Dinitrotoluene (121-14-2)			X												
28B. 2,6-Dinitrotoluene (606-20-2)			X												
29B. Di-N-Octyl Phthalate (117-84-0)			X												
30B. 1,2-Diphenylhydrazine (*as Azobenzene*) (122-66-7)			X												
31B. Fluoranthene (206-44-0)			X												
32B. Fluorene (86-73-7)			X												
33B. Hexachlorobenzene (118-74-1)			X												
34B. Hexachlorobutadiene (87-68-3)			X												
35B. Hexachlorocyclopentadiene (77-47-4)			X												
36B Hexachloroethane (67-72-1)			X												
37B. Indeno (*1,2,3-cd*) Pyrene (193-39-5)			X												
38B. Isophorone (78-59-1)			X												
39B. Naphthalene (91-20-3)			X												
40B. Nitrobenzene (98-95-3)			X												
41B. N-Nitrosodimethylamine (62-75-9)			X												
42B. N-Nitrosodi-N-Propylamine (621-64-7)			X												

CONTINUED FROM THE FRONT

1. POLLUTANT AND CAS NUMBER (*if available*)	2. MARK "X"			3. EFFLUENT							4. UNITS		5. INTAKE (*optional*)		
	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE (*if available*)		c. LONG TERM AVRG. VALUE (*if available*)		d. NO. OF ANALYSES	a. CONCEN-TRATION	b. MASS	a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
GC/MS FRACTION – BASE/NEUTRAL COMPOUNDS (*continued*)															
43B. N-Nitro-sodiphenylamine (86-30-6)			X												
44B. Phenanthrene (85-01-8)			X												
45B. Pyrene (129-00-0)			X												
46B. 1,2,4-Tri-chlorobenzene (120-82-1)			X												
GC/MS FRACTION – PESTICIDES															
1P. Aldrin (309-00-2)			X												
2P. α-BHC (319-84-6)			X												
3P. β-BHC (319-85-7)			X												
4P. γ-BHC (58-89-9)			X												
5P. δ-BHC (319-86-8)			X												
6P. Chlordane (57-74-9)			X												
7P. 4,4'-DDT (50-29-3)			X												
8P. 4,4'-DDE (72-55-9)			X												
9P. 4,4'-DDD (72-54-8)			X												
10P. Dieldrin (60-57-1)			X												
11P. α-Enosulfan (115-29-7)			X												
12P. β-Endosulfan (115-29-7)			X												
13P. Endosulfan Sulfate (1031-07-8)			X												
14P. Endrin (72-20-8)			X												
15P. Endrin Aldehyde (7421-93-4)			X												
16P. Heptachlor (76-44-8)			X												

EPA I.D. NUMBER (*copy from Item 1 of Form 1*)	OUTFALL NUMBER
VA 0006254	001

CONTINUED FROM PAGE V-8

1. POLLUTANT AND CAS NUMBER (*if available*)	2. MARK "X"			3. EFFLUENT							4. UNITS		5. INTAKE (*optional*)		
	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE (*if available*)		c. LONG TERM AVRG. VALUE (*if available*)		d. NO. OF ANALYSES	a. CONCEN-TRATION	b. MASS	a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
GC/MS FRACTION – PESTICIDES (*continued*)															
17P. Heptachlor Epoxide (1024-57-3)			X												
18P. PCB-1242 (53469-21-9)			X												
19P. PCB-1254 (11097-69-1)			X												
20P. PCB-1221 (11104-28-2)			X												
21P. PCB-1232 (11141-16-5)			X												
22P. PCB-1248 (12672-29-6)			X												
23P. PCB-1260 (11096-82-5)			X												
24P. PCB-1016 (12674-11-2)			X												
25P. Toxaphene (8001-35-2)			X												

ATTACHMENT F

Data Source Table for MSTRANTI, MSTRANTI, STATS Results

MSTRANTI DATA SOURCE REPORT

Stream Information	
Mean Hardness	The receiving stream is a Tier 1 stream, which is subject to surface water withdrawals and is assumed to be dry during low flow conditions. During the low flow conditions, the stream flow consists entirely of effluent flow. Therefore, the effluent conditions are used for the stream data in the MSTRANTI spreadsheet.
90% Temperature (annual)	
90% Temperature (wet season)	
90% Maximum pH	
10% Maximum pH	
Tier Designation	Flow Frequency Memo
Stream Flows	
All Data	The receiving stream is a Tier 1 stream, which is subject to surface water withdrawals and is assumed to be dry during low flow conditions. During the low flow conditions, the stream flow consists entirely of effluent flow. Therefore, the effluent conditions are used for the stream data in the MSTRANTI spreadsheet.
Mixing Information	
All Data	Because the stream flows during low flow conditions are assumed to be 100% effluent, 100% mixing is assumed.
Effluent Information	
Mean Hardness	The most conservative default value is used.
90% Temperature (annual)	Permit Application
90% Maximum pH	
10% Maximum pH	
Discharge Flow	

Data Location:

Flow Frequency Memo – Attachment A
Application Data – Attachment E

FRESHWATER
WATER QUALITY CRITERIA / WASTELOAD ALLOCATION ANALYSIS

Facility Name: Addison-Evans Water Production and Laboratory Permit No.: VA0006254

Receiving Stream: Swift Creek Version: OWP Guidance Memo 00-2011 (8/24/00)

Stream Information		
Mean Hardness (as CaCO3) =	25	mg/L
90% Temperature (Annual) =	29.7	deg C
90% Temperature (Wet season) =	NA	deg C
90% Maximum pH =	6.3	SU
10% Maximum pH =	6.3	SU
Tier Designation (1 or 2) =	1	
Public Water Supply (PWS) Y/N? =	y	
Trout Present Y/N? =	n	
Early Life Stages Present Y/N? =	y	

Stream Flows		
1Q10 (Annual) =	0	MGD
7Q10 (Annual) =	0	MGD
30Q10 (Annual) =	0	MGD
1Q10 (Wet season) =	NA	MGD
30Q10 (Wet season)	NA	MGD
30Q5 =	0	MGD
Harmonic Mean =	0	MGD

Mixing Information		
Annual - 1Q10 Mix =	0	%
- 7Q10 Mix =	0	%
- 30Q10 Mix =	0	%
Wet Season - 1Q10 Mix =	NA	%
- 30Q10 Mix =	NA	%

Effluent Information		
Mean Hardness (as CaCO3) =	25	mg/L
90% Temp (Annual) =	29.7	deg C
90% Temp (Wet season) =	NA	deg C
90% Maximum pH =	6.3	SU
10% Maximum pH =	6.3	SU
Discharge Flow =	0.5	MGD

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				**Most Limiting Allocations**			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	**Acute**	**Chronic**	**HH (PWS)**	**HH**
Acenapthene	0	--	--	6.7E+02	9.9E+02	--	--	6.7E+02	9.9E+02	--	--	--	--	--	--	--	--	**--**	**--**	**6.7E+02**	**9.9E+02**
Acrolein	0	--	--	6.1E+00	9.3E+00	--	--	6.1E+00	9.3E+00	--	--	--	--	--	--	--	--	**--**	**--**	**6.1E+00**	**9.3E+00**
Acrylonitrile[C]	0	--	--	5.1E-01	2.5E+00	--	--	5.1E-01	2.5E+00	--	--	--	--	--	--	--	--	**--**	**--**	**5.1E-01**	**2.5E+00**
Aldrin [C]	0	3.0E+00	--	4.9E-04	5.0E-04	3.0E+00	--	4.9E-04	5.0E-04	--	--	--	--	--	--	--	--	**3.0E+00**	**--**	**4.9E-04**	**5.0E-04**
Ammonia-N (mg/l) (Yearly)	0	5.20E+01	2.56E+00	--	--	5.20E+01	#######	--	--	--	--	--	--	--	--	--	--	**5.20E+01**	**2.56E+00**	**--**	**--**
Ammonia-N (mg/l) (High Flow)	0	#VALUE!	#VALUE!	--	--	#VALUE!	#VALUE!	--	--	--	--	--	--	--	--	--	--	**#VALUE!**	**#VALUE!**	**--**	**--**
Anthracene	0	--	--	8.3E+03	4.0E+04	--	--	8.3E+03	4.0E+04	--	--	--	--	--	--	--	--	**--**	**--**	**8.3E+03**	**4.0E+04**
Antimony	0	--	--	5.6E+00	6.4E+02	--	--	5.6E+00	6.4E+02	--	--	--	--	--	--	--	--	**--**	**--**	**5.6E+00**	**6.4E+02**
Arsenic	0	3.4E+02	1.5E+02	1.0E+01	--	3.4E+02	1.5E+02	1.0E+01	--	--	--	--	--	--	--	--	--	**3.4E+02**	**1.5E+02**	**1.0E+01**	**--**
Barium	0	--	--	2.0E+03	--	--	--	2.0E+03	--	--	--	--	--	--	--	--	--	**--**	**--**	**2.0E+03**	**--**
Benzene [C]	0	--	--	2.2E+01	5.1E+02	--	--	2.2E+01	5.1E+02	--	--	--	--	--	--	--	--	**--**	**--**	**2.2E+01**	**5.1E+02**
Benzidine[C]	0	--	--	8.6E-04	2.0E-03	--	--	8.6E-04	2.0E-03	--	--	--	--	--	--	--	--	**--**	**--**	**8.6E-04**	**2.0E-03**
Benzo (a) anthracene [C]	0	--	--	3.8E-02	1.8E-01	--	--	3.8E-02	1.8E-01	--	--	--	--	--	--	--	--	**--**	**--**	**3.8E-02**	**1.8E-01**
Benzo (b) fluoranthene [C]	0	--	--	3.8E-02	1.8E-01	--	--	3.8E-02	1.8E-01	--	--	--	--	--	--	--	--	**--**	**--**	**3.8E-02**	**1.8E-01**
Benzo (k) fluoranthene [C]	0	--	--	3.8E-02	1.8E-01	--	--	3.8E-02	1.8E-01	--	--	--	--	--	--	--	--	**--**	**--**	**3.8E-02**	**1.8E-01**
Benzo (a) pyrene [C]	0	--	--	3.8E-02	1.8E-01	--	--	3.8E-02	1.8E-01	--	--	--	--	--	--	--	--	**--**	**--**	**3.8E-02**	**1.8E-01**
Bis2-Chloroethyl Ether [C]	0	--	--	3.0E-01	5.3E+00	--	--	3.0E-01	5.3E+00	--	--	--	--	--	--	--	--	**--**	**--**	**3.0E-01**	**5.3E+00**
Bis2-Chloroisopropyl Ether	0	--	--	1.4E+03	6.5E+04	--	--	1.4E+03	6.5E+04	--	--	--	--	--	--	--	--	**--**	**--**	**1.4E+03**	**6.5E+04**
Bis 2-Ethylhexyl Phthalate [C]	0	--	--	1.2E+01	2.2E+01	--	--	1.2E+01	2.2E+01	--	--	--	--	--	--	--	--	**--**	**--**	**1.2E+01**	**2.2E+01**
Bromoform [C]	0	--	--	4.3E+01	1.4E+03	--	--	4.3E+01	1.4E+03	--	--	--	--	--	--	--	--	**--**	**--**	**4.3E+01**	**1.4E+03**
Butylbenzylphthalate	0	--	--	1.5E+03	1.9E+03	--	--	1.5E+03	1.9E+03	--	--	--	--	--	--	--	--	**--**	**--**	**1.5E+03**	**1.9E+03**
Cadmium	0	8.2E-01	3.8E-01	5.0E+00	--	8.2E-01	3.8E-01	5.0E+00	--	--	--	--	--	--	--	--	--	**8.2E-01**	**3.8E-01**	**5.0E+00**	**--**
Carbon Tetrachloride [C]	0	--	--	2.3E+00	1.6E+01	--	--	2.3E+00	1.6E+01	--	--	--	--	--	--	--	--	**--**	**--**	**2.3E+00**	**1.6E+01**
Chlordane [C]	0	2.4E+00	4.3E-03	8.0E-03	8.1E-03	2.4E+00	4.3E-03	8.0E-03	8.1E-03	--	--	--	--	--	--	--	--	**2.4E+00**	**4.3E-03**	**8.0E-03**	**8.1E-03**
Chloride	0	8.6E+05	2.3E+05	2.5E+05	--	8.6E+05	2.3E+05	2.5E+05	--	--	--	--	--	--	--	--	--	**8.6E+05**	**2.3E+05**	**2.5E+05**	**--**
TRC	0	1.9E+01	1.1E+01	--	--	1.9E+01	1.1E+01	--	--	--	--	--	--	--	--	--	--	**1.9E+01**	**1.1E+01**	**--**	**--**
Chlorobenzene	0	--	--	1.3E+02	1.6E+03	--	--	1.3E+02	1.6E+03	--	--	--	--	--	--	--	--	**--**	**--**	**1.3E+02**	**1.6E+03**

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				**Most Limiting Allocations**			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	**Acute**	**Chronic**	**HH (PWS)**	**HH**
Chlorodibromomethane[C]	0	--	--	4.0E+00	1.3E+02	--	--	4.0E+00	1.3E+02	--	--	--	--	--	--	--	--	**--**	**--**	**4.0E+00**	**1.3E+02**
Chloroform	0	--	--	3.4E+02	1.1E+04	--	--	3.4E+02	1.1E+04	--	--	--	--	--	--	--	--	**--**	**--**	**3.4E+02**	**1.1E+04**
2-Chloronaphthalene	0	--	--	1.0E+03	1.6E+03	--	--	1.0E+03	1.6E+03	--	--	--	--	--	--	--	--	**--**	**--**	**1.0E+03**	**1.6E+03**
2-Chlorophenol	0	--	--	8.1E+01	1.5E+02	--	--	8.1E+01	1.5E+02	--	--	--	--	--	--	--	--	**--**	**--**	**8.1E+01**	**1.5E+02**
Chlorpyrifos	0	8.3E-02	4.1E-02	--	--	8.3E-02	4.1E-02	--	--	--	--	--	--	--	--	--	--	**8.3E-02**	**4.1E-02**	**--**	**--**
Chromium III	0	1.8E+02	2.4E+01	--	--	1.8E+02	2.4E+01	--	--	--	--	--	--	--	--	--	--	**1.8E+02**	**2.4E+01**	**--**	**--**
Chromium VI	0	1.6E+01	1.1E+01	--	--	1.6E+01	1.1E+01	--	--	--	--	--	--	--	--	--	--	**1.6E+01**	**1.1E+01**	**--**	**--**
Chromium, Total	0	--	--	1.0E+02	--	--	--	1.0E+02	--	--	--	--	--	--	--	--	--	**--**	**--**	**1.0E+02**	**--**
Chrysene [C]	0	--	--	3.8E-03	1.8E-02	--	--	3.8E-03	1.8E-02	--	--	--	--	--	--	--	--	**--**	**--**	**3.8E-03**	**1.8E-02**
Copper	0	3.6E+00	2.7E+00	1.3E+03	--	3.6E+00	2.7E+00	1.3E+03	--	--	--	--	--	--	--	--	--	**3.6E+00**	**2.7E+00**	**1.3E+03**	**--**
Cyanide, Free	0	2.2E+01	5.2E+00	1.4E+02	1.6E+04	2.2E+01	5.2E+00	1.4E+02	1.6E+04	--	--	--	--	--	--	--	--	**2.2E+01**	**5.2E+00**	**1.4E+02**	**1.6E+04**
DDD [C]	0	--	--	3.1E-03	3.1E-03	--	--	3.1E-03	3.1E-03	--	--	--	--	--	--	--	--	**--**	**--**	**3.1E-03**	**3.1E-03**
DDE [C]	0	--	--	2.2E-03	2.2E-03	--	--	2.2E-03	2.2E-03	--	--	--	--	--	--	--	--	**--**	**--**	**2.2E-03**	**2.2E-03**
DDT [C]	0	1.1E+00	1.0E-03	2.2E-03	2.2E-03	1.1E+00	1.0E-03	2.2E-03	2.2E-03	--	--	--	--	--	--	--	--	**1.1E+00**	**1.0E-03**	**2.2E-03**	**2.2E-03**
Demeton	0	--	1.0E-01	--	--	--	1.0E-01	--	--	--	--	--	--	--	--	--	--	**--**	**1.0E-01**	**--**	**--**
Diazinon	0	1.7E-01	1.7E-01	--	--	1.7E-01	1.7E-01	--	--	--	--	--	--	--	--	--	--	**1.7E-01**	**1.7E-01**	**--**	**--**
Dibenz(a,h)anthracene [C]	0	--	--	3.8E-02	1.8E-01	--	--	3.8E-02	1.8E-01	--	--	--	--	--	--	--	--	**--**	**--**	**3.8E-02**	**1.8E-01**
1,2-Dichlorobenzene	0	--	--	4.2E+02	1.3E+03	--	--	4.2E+02	1.3E+03	--	--	--	--	--	--	--	--	**--**	**--**	**4.2E+02**	**1.3E+03**
1,3-Dichlorobenzene	0	--	--	3.2E+02	9.6E+02	--	--	3.2E+02	9.6E+02	--	--	--	--	--	--	--	--	**--**	**--**	**3.2E+02**	**9.6E+02**
1,4-Dichlorobenzene	0	--	--	6.3E+01	1.9E+02	--	--	6.3E+01	1.9E+02	--	--	--	--	--	--	--	--	**--**	**--**	**6.3E+01**	**1.9E+02**
3,3-Dichlorobenzidine[C]	0	--	--	2.1E-01	2.8E-01	--	--	2.1E-01	2.8E-01	--	--	--	--	--	--	--	--	**--**	**--**	**2.1E-01**	**2.8E-01**
Dichlorobromomethane [C]	0	--	--	5.5E+00	1.7E+02	--	--	5.5E+00	1.7E+02	--	--	--	--	--	--	--	--	**--**	**--**	**5.5E+00**	**1.7E+02**
1,2-Dichloroethane [C]	0	--	--	3.8E+00	3.7E+02	--	--	3.8E+00	3.7E+02	--	--	--	--	--	--	--	--	**--**	**--**	**3.8E+00**	**3.7E+02**
1,1-Dichloroethylene	0	--	--	3.3E+02	7.1E+03	--	--	3.3E+02	7.1E+03	--	--	--	--	--	--	--	--	**--**	**--**	**3.3E+02**	**7.1E+03**
1,2-trans-dichloroethylene	0	--	--	1.4E+02	1.0E+04	--	--	1.4E+02	1.0E+04	--	--	--	--	--	--	--	--	**--**	**--**	**1.4E+02**	**1.0E+04**
2,4-Dichlorophenol	0	--	--	7.7E+01	2.9E+02	--	--	7.7E+01	2.9E+02	--	--	--	--	--	--	--	--	**--**	**--**	**7.7E+01**	**2.9E+02**
2,4-Dichlorophenoxy acetic acid (2,4-D)	0	--	--	1.0E+02	--	--	--	1.0E+02	--	--	--	--	--	--	--	--	--	**--**	**--**	**1.0E+02**	**--**
1,2-Dichloropropane[C]	0	--	--	5.0E+00	1.5E+02	--	--	5.0E+00	1.5E+02	--	--	--	--	--	--	--	--	**--**	**--**	**5.0E+00**	**1.5E+02**
1,3-Dichloropropene [C]	0	--	--	3.4E+00	2.1E+02	--	--	3.4E+00	2.1E+02	--	--	--	--	--	--	--	--	**--**	**--**	**3.4E+00**	**2.1E+02**
Dieldrin [C]	0	2.4E-01	5.6E-02	5.2E-04	5.4E-04	2.4E-01	5.6E-02	5.2E-04	5.4E-04	--	--	--	--	--	--	--	--	**2.4E-01**	**5.6E-02**	**5.2E-04**	**5.4E-04**
Diethyl Phthalate	0	--	--	1.7E+04	4.4E+04	--	--	1.7E+04	4.4E+04	--	--	--	--	--	--	--	--	**--**	**--**	**1.7E+04**	**4.4E+04**
2,4-Dimethylphenol	0	--	--	3.8E+02	8.5E+02	--	--	3.8E+02	8.5E+02	--	--	--	--	--	--	--	--	**--**	**--**	**3.8E+02**	**8.5E+02**
Dimethyl Phthalate	0	--	--	2.7E+05	1.1E+06	--	--	2.7E+05	1.1E+06	--	--	--	--	--	--	--	--	**--**	**--**	**2.7E+05**	**1.1E+06**
Di-n-Butyl Phthalate	0	--	--	2.0E+03	4.5E+03	--	--	2.0E+03	4.5E+03	--	--	--	--	--	--	--	--	**--**	**--**	**2.0E+03**	**4.5E+03**
2,4 Dinitrophenol	0	--	--	6.9E+01	5.3E+03	--	--	6.9E+01	5.3E+03	--	--	--	--	--	--	--	--	**--**	**--**	**6.9E+01**	**5.3E+03**
2-Methyl-4,6-Dinitrophenol	0	--	--	1.3E+01	2.8E+02	--	--	1.3E+01	2.8E+02	--	--	--	--	--	--	--	--	**--**	**--**	**1.3E+01**	**2.8E+02**
2,4-Dinitrotoluene [C]	0	--	--	1.1E+00	3.4E+01	--	--	1.1E+00	3.4E+01	--	--	--	--	--	--	--	--	**--**	**--**	**1.1E+00**	**3.4E+01**
Dioxin 2,3,7,8-tetrachlorodibenzo-p-dioxin	0	--	--	5.0E-08	5.1E-08	--	--	5.0E-08	5.1E-08	--	--	--	--	--	--	--	--	**--**	**--**	**5.0E-08**	**5.1E-08**
1,2-Diphenylhydrazine[C]	0	--	--	3.6E-01	2.0E+00	--	--	3.6E-01	2.0E+00	--	--	--	--	--	--	--	--	**--**	**--**	**3.6E-01**	**2.0E+00**
Alpha-Endosulfan	0	2.2E-01	5.6E-02	6.2E+01	8.9E+01	2.2E-01	5.6E-02	6.2E+01	8.9E+01	--	--	--	--	--	--	--	--	**2.2E-01**	**5.6E-02**	**6.2E+01**	**8.9E+01**
Beta-Endosulfan	0	2.2E-01	5.6E-02	6.2E+01	8.9E+01	2.2E-01	5.6E-02	6.2E+01	8.9E+01	--	--	--	--	--	--	--	--	**2.2E-01**	**5.6E-02**	**6.2E+01**	**8.9E+01**
Alpha + Beta Endosulfan	0	2.2E-01	5.6E-02	--	--	2.2E-01	5.6E-02	--	--	--	--	--	--	--	--	--	--	**2.2E-01**	**5.6E-02**	**--**	**--**
Endosulfan Sulfate	0	--	--	6.2E+01	8.9E+01	--	--	6.2E+01	8.9E+01	--	--	--	--	--	--	--	--	**--**	**--**	**6.2E+01**	**8.9E+01**
Endrin	0	8.6E-02	3.6E-02	5.9E-02	6.0E-02	8.6E-02	3.6E-02	5.9E-02	6.0E-02	--	--	--	--	--	--	--	--	**8.6E-02**	**3.6E-02**	**5.9E-02**	**6.0E-02**
Endrin Aldehyde	0	--	--	2.9E-01	3.0E-01	--	--	2.9E-01	3.0E-01	--	--	--	--	--	--	--	--	**--**	**--**	**2.9E-01**	**3.0E-01**

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				**Most Limiting Allocations**			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	**Acute**	**Chronic**	**HH (PWS)**	**HH**
Ethylbenzene	0	--	--	5.3E+02	2.1E+03	--	--	5.3E+02	2.1E+03	--	--	--	--	--	--	--	--	**--**	**--**	**5.3E+02**	**2.1E+03**
Fluoranthene	0	--	--	1.3E+02	1.4E+02	--	--	1.3E+02	1.4E+02	--	--	--	--	--	--	--	--	**--**	**--**	**1.3E+02**	**1.4E+02**
Fluorene	0	--	--	1.1E+03	5.3E+03	--	--	1.1E+03	5.3E+03	--	--	--	--	--	--	--	--	**--**	**--**	**1.1E+03**	**5.3E+03**
Foaming Agents	0	--	--	5.0E+02	--	--	--	5.0E+02	--	--	--	--	--	--	--	--	--	**--**	**--**	**5.0E+02**	**--**
Guthion	0	--	1.0E-02	--	--	--	1.0E-02	--	--	--	--	--	--	--	--	--	--	**--**	**1.0E-02**	**--**	**--**
Heptachlor [C]	0	5.2E-01	3.8E-03	7.9E-04	7.9E-04	5.2E-01	3.8E-03	7.9E-04	7.9E-04	--	--	--	--	--	--	--	--	**5.2E-01**	**3.8E-03**	**7.9E-04**	**7.9E-04**
Heptachlor Epoxide[C]	0	5.2E-01	3.8E-03	3.9E-04	3.9E-04	5.2E-01	3.8E-03	3.9E-04	3.9E-04	--	--	--	--	--	--	--	--	**5.2E-01**	**3.8E-03**	**3.9E-04**	**3.9E-04**
Hexachlorobenzene[C]	0	--	--	2.8E-03	2.9E-03	--	--	2.8E-03	2.9E-03	--	--	--	--	--	--	--	--	**--**	**--**	**2.8E-03**	**2.9E-03**
Hexachlorobutadiene[C]	0	--	--	4.4E+00	1.8E+02	--	--	4.4E+00	1.8E+02	--	--	--	--	--	--	--	--	**--**	**--**	**4.4E+00**	**1.8E+02**
Hexachlorocyclohexane Alpha-BHC[C]	0	--	--	2.6E-02	4.9E-02	--	--	2.6E-02	4.9E-02	--	--	--	--	--	--	--	--	**--**	**--**	**2.6E-02**	**4.9E-02**
Hexachlorocyclohexane Beta-BHC[C]	0	--	--	9.1E-02	1.7E-01	--	--	9.1E-02	1.7E-01	--	--	--	--	--	--	--	--	**--**	**--**	**9.1E-02**	**1.7E-01**
Hexachlorocyclohexane Gamma-BHC[C] (Lindane)	0	9.5E-01	--	9.8E-01	1.8E+00	9.5E-01	--	9.8E-01	1.8E+00	--	--	--	--	--	--	--	--	**9.5E-01**	**--**	**9.8E-01**	**1.8E+00**
Hexachlorocyclopentadiene	0	--	--	4.0E+01	1.1E+03	--	--	4.0E+01	1.1E+03	--	--	--	--	--	--	--	--	**--**	**--**	**4.0E+01**	**1.1E+03**
Hexachloroethane[C]	0	--	--	1.4E+01	3.3E+01	--	--	1.4E+01	3.3E+01	--	--	--	--	--	--	--	--	**--**	**--**	**1.4E+01**	**3.3E+01**
Hydrogen Sulfide	0	--	2.0E+00	--	--	--	2.0E+00	--	--	--	--	--	--	--	--	--	--	**--**	**2.0E+00**	**--**	**--**
Indeno (1,2,3-cd) pyrene [C]	0	--	--	3.8E-02	1.8E-01	--	--	3.8E-02	1.8E-01	--	--	--	--	--	--	--	--	**--**	**--**	**3.8E-02**	**1.8E-01**
Iron	0	--	--	3.0E+02	--	--	--	3.0E+02	--	--	--	--	--	--	--	--	--	**--**	**--**	**3.0E+02**	**--**
Isophorone[C]	0	--	--	3.5E+02	9.6E+03	--	--	3.5E+02	9.6E+03	--	--	--	--	--	--	--	--	**--**	**--**	**3.5E+02**	**9.6E+03**
Kepone	0	--	0.0E+00	--	--	--	0.0E+00	--	--	--	--	--	--	--	--	--	--	**--**	**0.0E+00**	**--**	**--**
Lead	0	2.0E+01	2.3E+00	1.5E+01	--	2.0E+01	2.3E+00	1.5E+01	--	--	--	--	--	--	--	--	--	**2.0E+01**	**2.3E+00**	**1.5E+01**	**--**
Malathion	0	--	1.0E-01	--	--	--	1.0E-01	--	--	--	--	--	--	--	--	--	--	**--**	**1.0E-01**	**--**	**--**
Manganese	0	--	--	5.0E+01	--	--	--	5.0E+01	--	--	--	--	--	--	--	--	--	**--**	**--**	**5.0E+01**	**--**
Mercury	0	1.4E+00	7.7E-01	- -	- -	1.4E+00	7.7E-01	- -	- -	--	--	--	--	--	--	--	--	**1.4E+00**	**7.7E-01**	**- -**	**- -**
Methyl Bromide	0	--	--	4.7E+01	1.5E+03	--	--	4.7E+01	1.5E+03	--	--	--	--	--	--	--	--	**--**	**--**	**4.7E+01**	**1.5E+03**
Methylene Chloride [C]	0	--	--	4.6E+01	5.9E+03	--	--	4.6E+01	5.9E+03	--	--	--	--	--	--	--	--	**--**	**--**	**4.6E+01**	**5.9E+03**
Methoxychlor	0	--	3.0E-02	1.0E+02	--	--	3.0E-02	1.0E+02	--	--	--	--	--	--	--	--	--	**--**	**3.0E-02**	**1.0E+02**	**--**
Mirex	0	--	0.0E+00	--	--	--	0.0E+00	--	--	--	--	--	--	--	--	--	--	**--**	**0.0E+00**	**--**	**--**
Nickel	0	5.6E+01	6.3E+00	6.1E+02	4.6E+03	5.6E+01	6.3E+00	6.1E+02	4.6E+03	--	--	--	--	--	--	--	--	**5.6E+01**	**6.3E+00**	**6.1E+02**	**4.6E+03**
Nitrate (as N)	0	--	--	1.0E+04	--	--	--	1.0E+04	--	--	--	--	--	--	--	--	--	**--**	**--**	**1.0E+04**	**--**
Nitrobenzene	0	--	--	1.7E+01	6.9E+02	--	--	1.7E+01	6.9E+02	--	--	--	--	--	--	--	--	**--**	**--**	**1.7E+01**	**6.9E+02**
N-Nitrosodimethylamine[C]	0	--	--	6.9E-03	3.0E+01	--	--	6.9E-03	3.0E+01	--	--	--	--	--	--	--	--	**--**	**--**	**6.9E-03**	**3.0E+01**
N-Nitrosodiphenylamine[C]	0	--	--	3.3E+01	6.0E+01	--	--	3.3E+01	6.0E+01	--	--	--	--	--	--	--	--	**--**	**--**	**3.3E+01**	**6.0E+01**
N-Nitrosodi-n-propylamine[C]	0	--	--	5.0E-02	5.1E+00	--	--	5.0E-02	5.1E+00	--	--	--	--	--	--	--	--	**--**	**--**	**5.0E-02**	**5.1E+00**
Nonylphenol	0	2.8E+01	6.6E+00	--	--	2.8E+01	6.6E+00	--	--	--	--	--	--	--	--	--	--	**2.8E+01**	**6.6E+00**	**--**	**--**
Parathion	0	6.5E-02	1.3E-02	--	--	6.5E-02	1.3E-02	--	--	--	--	--	--	--	--	--	--	**6.5E-02**	**1.3E-02**	**--**	**--**
PCB Total[C]	0	--	1.4E-02	6.4E-04	6.4E-04	--	1.4E-02	6.4E-04	6.4E-04	--	--	--	--	--	--	--	--	**--**	**1.4E-02**	**6.4E-04**	**6.4E-04**
Pentachlorophenol [C]	0	4.3E+00	3.3E+00	2.7E+00	3.0E+01	4.3E+00	3.3E+00	2.7E+00	3.0E+01	--	--	--	--	--	--	--	--	**4.3E+00**	**3.3E+00**	**2.7E+00**	**3.0E+01**
Phenol	0	--	--	1.0E+04	8.6E+05	--	--	1.0E+04	8.6E+05	--	--	--	--	--	--	--	--	**--**	**--**	**1.0E+04**	**8.6E+05**
Pyrene	0	--	--	8.3E+02	4.0E+03	--	--	8.3E+02	4.0E+03	--	--	--	--	--	--	--	--	**--**	**--**	**8.3E+02**	**4.0E+03**
Radionuclides	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**--**	**--**	**--**	**--**
Gross Alpha Activity (pCi/L)	0	--	--	1.5E+01	--	--	--	1.5E+01	--	--	--	--	--	--	--	--	--	**--**	**--**	**1.5E+01**	**--**
Beta and Photon Activity (mrem/yr)	0	--	--	4.0E+00	--	--	--	4.0E+00	--	--	--	--	--	--	--	--	--	**--**	**--**	**4.0E+00**	**--**
Radium 226 + 228 (pCi/L)	0	--	--	5.0E+00	--	--	--	5.0E+00	--	--	--	--	--	--	--	--	--	**--**	**--**	**5.0E+00**	**--**
Uranium (ug/l)	0	--	--	3.0E+01	--	--	--	3.0E+01	--	--	--	--	--	--	--	--	--	**--**	**--**	**3.0E+01**	**--**

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				**Most Limiting Allocations**			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	**Acute**	**Chronic**	**HH (PWS)**	**HH**
Selenium, Total Recoverable	0	2.0E+01	5.0E+00	1.7E+02	4.2E+03	2.0E+01	5.0E+00	1.7E+02	4.2E+03	--	--	--	--	--	--	--	--	**2.0E+01**	**5.0E+00**	**1.7E+02**	**4.2E+03**
Silver	0	3.2E-01	--	--	--	3.2E-01	--	--	--	--	--	--	--	--	--	--	--	**3.2E-01**	**--**	**--**	**--**
Sulfate	0	--	--	2.5E+05	--	--	--	2.5E+05	--	--	--	--	--	--	--	--	--	**--**	**--**	**2.5E+05**	**--**
1,1,2,2-Tetrachloroethane[C]	0	--	--	1.7E+00	4.0E+01	--	--	1.7E+00	4.0E+01	--	--	--	--	--	--	--	--	**--**	**--**	**1.7E+00**	**4.0E+01**
Tetrachloroethylene[C]	0	--	--	6.9E+00	3.3E+01	--	--	6.9E+00	3.3E+01	--	--	--	--	--	--	--	--	**--**	**--**	**6.9E+00**	**3.3E+01**
Thallium	0	--	--	2.4E-01	4.7E-01	--	--	2.4E-01	4.7E-01	--	--	--	--	--	--	--	--	**--**	**--**	**2.4E-01**	**4.7E-01**
Toluene	0	--	--	5.1E+02	6.0E+03	--	--	5.1E+02	6.0E+03	--	--	--	--	--	--	--	--	**--**	**--**	**5.1E+02**	**6.0E+03**
Total dissolved solids	0	--	--	5.0E+05	--	--	--	5.0E+05	--	--	--	--	--	--	--	--	--	**--**	**--**	**5.0E+05**	**--**
Toxaphene [C]	0	7.3E-01	2.0E-04	2.8E-03	2.8E-03	7.3E-01	2.0E-04	2.8E-03	2.8E-03	--	--	--	--	--	--	--	--	**7.3E-01**	**2.0E-04**	**2.8E-03**	**2.8E-03**
Tributyltin	0	4.6E-01	7.2E-02	--	--	4.6E-01	7.2E-02	--	--	--	--	--	--	--	--	--	--	**4.6E-01**	**7.2E-02**	**--**	**--**
1,2,4-Trichlorobenzene	0	--	--	3.5E+01	7.0E+01	--	--	3.5E+01	7.0E+01	--	--	--	--	--	--	--	--	**--**	**--**	**3.5E+01**	**7.0E+01**
1,1,2-Trichloroethane[C]	0	--	--	5.9E+00	1.6E+02	--	--	5.9E+00	1.6E+02	--	--	--	--	--	--	--	--	**--**	**--**	**5.9E+00**	**1.6E+02**
Trichloroethylene [C]	0	--	--	2.5E+01	3.0E+02	--	--	2.5E+01	3.0E+02	--	--	--	--	--	--	--	--	**--**	**--**	**2.5E+01**	**3.0E+02**
2,4,6-Trichlorophenol [C]	0	--	--	1.4E+01	2.4E+01	--	--	1.4E+01	2.4E+01	--	--	--	--	--	--	--	--	**--**	**--**	**1.4E+01**	**2.4E+01**
2-(2,4,5-Trichlorophenoxy) propionic acid (Silvex)	0	--	--	5.0E+01	--	--	--	5.0E+01	--	--	--	--	--	--	--	--	--	**--**	**--**	**5.0E+01**	**--**
Vinyl Chloride[C]	0	--	--	2.5E-01	2.4E+01	--	--	2.5E-01	2.4E+01	--	--	--	--	--	--	--	--	**--**	**--**	**2.5E-01**	**2.4E+01**
Zinc	0	3.6E+01	3.6E+01	7.4E+03	2.6E+04	3.6E+01	3.6E+01	7.4E+03	2.6E+04	--	--	--	--	--	--	--	--	**3.6E+01**	**3.6E+01**	**7.4E+03**	**2.6E+04**

Notes:

1. All concentrations expressed as micrograms/liter (ug/l), unless noted otherwise
2. Discharge flow is highest monthly average or Form 2C maximum for Industries and design flow for Municipals
3. Metals measured as Dissolved, unless specified otherwise
4. "C" indicates a carcinogenic parameter
5. Regular WLAs are mass balances (minus background concentration) using the % of stream flow entered above under Mixing Information.
   Antidegradation WLAs are based upon a complete mix.
6. Antideg. Baseline = (0.25(WQC - background conc.) + background conc.) for acute and chronic
   = (0.1(WQC - background conc.) + background conc.) for human health
7. WLAs established at the following stream flows: 1Q10 for Acute, 30Q10 for Chronic Ammonia, 7Q10 for Other Chronic, 30Q5 for Non-carcinogens and Harmonic Mean for Carcinogens. To apply mixing ratios from a model set the stream flow equal to (mixing ratio - 1), effluent flow equal to 1 and 100% mix.

Metal	Target Value (SSTV)
Antimony	5.6E+00
Arsenic	1.0E+01
Barium	2.0E+03
Cadmium	2.3E-01
Chromium III	1.4E+01
Chromium VI	6.4E+00
Copper	1.5E+00
Iron	3.0E+02
Lead	1.4E+00
Manganese	5.0E+01
Mercury	4.6E-01
Nickel	3.8E+00
Selenium	3.0E+00
Silver	1.3E-01
Zinc	1.4E+01

Note: do not use QL's lower than the minimum QL's provided in agency guidance

2/4/2016 12:46:50 PM

Facility = Addison-Evans
Chemical = Ammonia
Chronic averaging period = 30
WLAa = 52
WLAc = 2.56
Q.L. = 0.2
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 1
Expected Value = .45
Variance = .0729
C.V. = 0.6
97th percentile daily values = 1.09503
97th percentile 4 day average = .748705
97th percentile 30 day average= .542723
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

0.45

1/13/2016 1:14:48 PM

Facility = Addison-Evans
Chemical = TRC
Chronic averaging period = 4
WLAa = 19
WLAc = 11
Q.L. = 100
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 1
Expected Value = 20000
Variance = 1440000
C.V. = 0.6
97th percentile daily values = 48668.3
97th percentile 4 day average = 33275.8
97th percentile 30 day average= 24121.0
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

A limit is needed based on Chronic Toxicity
Maximum Daily Limit = 16.0883226245855
Average Weekly limit = 16.0883226245856
Average Monthly LImit = 16.0883226245856

The data are:

20000

ATTACHMENT G

Threatened and Endangered Species Coordination

VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY	**VPDES PERMITS** **Threatened and Endangered Species Coordination**
To: ☒ DGIF, Environmental Review Coordinator ☐ DCR ☐ USFWS, T/E Review Coordinator **From: Brian Wrenn, Piedmont Regional Office**	**Date Sent: 12/7/2015** **Permit Number: VA0006254**
Facility Name: Addison-Evans Water Production and Laboratory **Contact: David Sirois** **Phone: 804-318-8140** **Address: 13400 Hull Street Road, Chesterfield County**	**Location:** **USGS Quadrangle: Hallsboro** **Latitude/Longitude: 37°24'57" -77°38'43"** **Receiving Stream: Swift Creek below the dam** **Receiving Stream Flow Statistics used for Permit:** **See Attachment A**
Effluent Characteristics and Max Daily Flow: **0.500 MGD, water treatment wastewater limited for pH, TSS, TRC**	**Species Search Results (or attach database report and map):** **See attached map and species list**

Attach draft permit effluent limits page if available or attach existing effluent limits page (make sure it is clear in your email which one it is – draft current or existing).

DGIF email: Gladys.Cason@dgif.virginia.gov
USFWS email: margaret_byrne@fws.gov
DCR: If Natural Heritage Data Explorer (NHDE) has the needed information DCR does not need this form. If you have additional information you wish to add, you may do so in the comments field on the NHDE form. DCR will contact you directly if they need more information.

Attachment A

1Q30 = 0.00 cfs (0.000 MGD)
1Q10 = 0.00 cfs (0.000 MGD)
7Q10 = 0.00 cfs (0.000 MGD)
30Q10 = 0.00 cfs (0.000 MGD)
30Q5 = 0.00 cfs (0.000 MGD)
HM = undefined

Swift Creek below the dam. Swamps and lakes considered 0 flow.

VaFWIS Initial Project Assessment Report Compiled on 11/6/2015, 2:42:52 PM

Help

Known or likely to occur within a **2 mile radius around point 37,24,58.6 -77,38,53.9** in **041 Chesterfield County, VA**

View Map of Site Location

452 Known or Likely Species ordered by Status Concern for Conservation (displaying first 23) (23 species with Status* or Tier I** or Tier II**)

BOVA Code	Status*	Tier**	Common Name	Scientific Name	Confirmed	Database(s)
010032	FESE	II	Sturgeon, Atlantic	Acipenser oxyrinchus		BOVA
050022	FT		Bat, northern long-eared	Myotis septentrionalis		BOVA
040096	ST	I	Falcon, peregrine	Falco peregrinus		BOVA
040129	ST	I	Sandpiper, upland	Bartramia longicauda		BOVA
040293	ST	I	Shrike, loggerhead	Lanius ludovicianus		BOVA
020002	ST	II	Treefrog, barking	Hyla gratiosa		BOVA
040292	ST		Shrike, migrant loggerhead	Lanius ludovicianus migrans		BOVA
040093	FS	II	Eagle, bald	Haliaeetus leucocephalus		BOVA
060029	FS	III	Lance, yellow	Elliptio lanceolata	Yes	BOVA,SppObs
010038	FS	IV	Alewife	Alosa pseudoharengus		BOVA
100001	FS	IV	fritillary, Diana	Speyeria diana		BOVA
010045	FS		Herring, blueback	Alosa aestivalis		BOVA
030063	CC	III	Turtle, spotted	Clemmys guttata		BOVA
010077		I	Shiner, bridle	Notropis bifrenatus		BOVA
040225		I	Sapsucker, yellow-bellied	Sphyrapicus varius		BOVA
040319		I	Warbler, black-throated green	Dendroica virens		BOVA
040052		II	Duck, American black	Anas rubripes		BOVA
040029		II	Heron, little blue	Egretta caerulea caerulea		BOVA
040036		II	Night-heron, yellow-crowned	Nyctanassa violacea violacea		BOVA
040213		II	Owl, northern saw-whet	Aegolius acadicus		BOVA
040105		II	Rail, king	Rallus elegans		BOVA
040320		II	Warbler, cerulean	Dendroica cerulea		BOVA


Brandermill
Swift Creek Reservoir
604
651
654
621
652
654
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040266		II	Wren, winter	Troglodytes troglodytes		BOVA

To view **All 452 species** View 452

* FE=Federal Endangered; FT=Federal Threatened; SE=State Endangered; ST=State Threatened; FC=Federal Candidate; FS=Federal Species of Concern; CC=Collection Concern

** I=VA Wildlife Action Plan - Tier I - Critical Conservation Need; II=VA Wildlife Action Plan - Tier II - Very High Conservation Need; III=VA Wildlife Action Plan - Tier III - High Conservation Need; IV=VA Wildlife Action Plan - Tier IV - Moderate Conservation Need

Bat Colonies or Hibernacula: **Not Known**

Anadromous Fish Use Streams

N/A

Colonial Water Bird Survey

N/A

Threatened and Endangered Waters

N/A

Managed Trout Streams

N/A

Bald Eagle Concentration Areas and Roosts

N/A

Bald Eagle Nests

N/A

Habitat Predicted for Aquatic WAP Tier I & II Species

N/A

Habitat Predicted for Terrestrial WAP Tier I & II Species

N/A

Public Holdings:

N/A

Compiled on 11/6/2015, 2:42:56 PM I690781.0 report=IPA searchType= R dist= 3218 poi= 37,24,58.6 -77,38,53.9

PixelSize=64; Anadromous=0.195328; BECAR=0.175283; Bats=0.154318; Buffer=0.09992; County=1.057005; Impediments=0.205441; Init=1.121106; PublicLands=0.262214; SppObs=1.269642; TEWaters=0.189964; TierReaches=0.206657; TierTerrestrial=0.670275; Total=19.321785; Tracking_BOVA=13.571728; Trout=0.177551

Wrenn, Brian (DEQ)

From: nhreview (DCR)
Sent: Thursday, December 03, 2015 2:15 PM
To: Wrenn, Brian (DEQ)
Subject: VA0006254, Addison Evans Water Production and Laboratory
Attachments: 70041, DEQ VA0006254, Addison-Evans Water Production and Laboratory.pdf

Mr. Wrenn,

Please find attached the DCR-DNH comments for the above referenced project. The comments are in pdf format and can be printed for your records. Also species rank information is available at http://www.dcr.virginia.gov/natural-heritage/help for your reference.

Please note an updated information services order form is located on the Natural Heritage website at: http://www.dcr.virginia.gov/natural-heritage/nhserviceform/?non_fee

Please send a confirmation e-mail upon receipt of our comments. Let us know if you have any questions.

Thank you for your request.

Alli Baird, CLA, ASLA
VADCR - Division of Natural Heritage
600 East Main Street, 24th Floor
Richmond, VA 23219
804-692-0984
alice.baird@dcr.virginia.gov

Molly Joseph Ward
Secretary of Natural Resources

Clyde E. Cristman
Director

COMMONWEALTH of VIRGINIA
DEPARTMENT OF CONSERVATION AND RECREATION

Joe Elton
Deputy Director of Operations

Rochelle Altholz
Deputy Director of Administration and Finance

David Dowling
Deputy Director of Soil and Water and Dam Safety

December 3, 2015

Brian Wrenn
DEQ-PRO
4949-A Cox Road
Glen Allen, VA 23060

Re: VA0006254, Addison-Evans Water Production and Laboratory

Dear Mr. Wrenn:

The Department of Conservation and Recreation's Division of Natural Heritage (DCR) has searched its Biotics Data System for occurrences of natural heritage resources from the area outlined on the submitted map. Natural heritage resources are defined as the habitat of rare, threatened, or endangered plant and animal species, unique or exemplary natural communities, and significant geologic formations.

According to the information currently in our files, the Swift Creek Reservoir Stream Conservation Unit (SCU) is located within the project site. SCUs identify stream reaches that contain aquatic natural heritage resources, including 2 miles upstream and 1 mile downstream of documented occurrences, and all tributaries within this reach. SCUs are given a biodiversity significance ranking based on the rarity, quality, and number of element occurrences they contain; on a scale of 1-5, 1 being most significant. The Swift Creek Reservoir SCU has been given a biodiversity ranking of B3, which represents a site of high significance. The natural heritage resource associated with this site is:

Elliptio lanceolata	Yellow Lance	G2G3/S2S3/SOC/NL

The Yellow lance occurs in mid-sized rivers and second and third order streams. To survive, it needs a silt-free, stable streambed and well-oxygenated water that is free of pollutants. This species has been the subject of taxonomic debate in recent years (NatureServe, 2009). Currently in Virginia, the Yellow lance is recognized from populations in the Chowan, James, York, and Rappahannock, drainages and its range extends into Neuse-Tar river system in North Carolina. In recent years, significant population declines have been noted across its range (NatureServe, 2009). Please note that this species is currently classified as a species of concern by the United States Fish and Wildlife Service (USFWS); however, this designation has no official legal status.

Considered good indicators of the health of aquatic ecosystems, freshwater mussels are dependent on good water quality, good physical habitat conditions, and an environment that will support populations of host fish species (Williams et al., 1993). Because mussels are sedentary organisms, they are sensitive to water quality degradation related to increased sedimentation and pollution. They are also sensitive to habitat destruction through dam construction, channelization, and dredging, and the invasion of exotic mollusk species. The Yellow lance may be particularly sensitive to chemical pollutants and exposure to fine sediments from erosion (NatureServe, 2009).

To minimize impacts to aquatic resources, DCR recommends the use of uv/ozone to replace chlorination disinfection and utilization of new technologies as they become available to improve water quality. DCR supports a no mixing zone.

Under a Memorandum of Agreement established between the Virginia Department of Agriculture and Consumer Services (VDACS) and the DCR, DCR represents VDACS in comments regarding potential impacts on state-listed threatened and endangered plant and insect species. The current activity will not affect any documented state-listed plants or insects.

There are no State Natural Area Preserves under DCR's jurisdiction in the project vicinity.

New and updated information is continually added to Biotics. Please re-submit project information and map for an update on this natural heritage information if the scope of the project changes and/or six months has passed before it is utilized.

The Virginia Department of Game and Inland Fisheries (VDGIF) maintains a database of wildlife locations, including threatened and endangered species, trout streams, and anadromous fish waters that may contain information not documented in this letter. Their database may be accessed from http://vafwis.org/fwis/ or contact Ernie Aschenbach at 804-367-2733 or Ernie.Aschenbach@dgif.virginia.gov.

Should you have any questions or concerns, feel free to contact me at (804) 692-0984. Thank you for the opportunity to comment on this project.

Sincerely,

Alli Baird

Alli Baird, LA, ASLA
Coastal Zone Locality Liaison

Cc: Troy Andersen, USFWS

Literature Cited

NatureServe. 2009. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia. Available http://www.natureserve.org/explorer. (Accessed: April 5, 2010).

Williams, J.D., M.L. Warren, Jr., K.S. Cummings, J.L. Harris, and R.J. Neves. 1993. Conservation status of freshwater mussels of the United States and Canada. Fisheries 18: 6-9.

ATTACHMENT H

Groundwater Report and Evaluation

MEMORANDUM

DEPARTMENT OF ENVIRONMENTAL QUALITY
Piedmont Regional Office

4949-A Cox Road, Glen Allen, Virginia 23060-6295 **804/527-5020**

TO: **File**
FROM: **Brian Wrenn**
DATE: **March 15, 2016**
SUBJECT: **VPDES No. VA0006254 – Addison-Evans Water Production and Laboratory; Groundwater Monitoring Data Evaluation**

Background

Addison-Evans Water Production and Laboratory is located at 13400 Hull Street Road in Chesterfield County, Virginia. The facility withdraws and treats water from the Swift Creek Reservoir for distribution to Chesterfield County. Wastewater is produced from the backwash of 4 high-rate filters and from sludge removal from sedimentation basins. Wastewater flows into a three-cell sludge lagoon. The facility has a permit to discharge no more than 0.500 million gallons per day (MGD) of wastewater from the facility to a dry ditch to Swift Creek. As required by Part I.B.5 (Groundwater Monitoring) of the facility's VPDES Permit No. VA0006254, effective on April 5, 2011, the facility submitted a revised Ground Water Monitoring Plan (GWMP) on June 30, 2011 which was approved with revisions by the Department of Environmental Quality (DEQ) on August 16, 2011. The facility has submitted groundwater monitoring data in accordance with this plan to determine if system integrity is being maintained and to indicate if activities at the site are resulting in violations of the Board's Ground Water Standards.

This facility is subject to Ground Water Standards Applicable Statewide (9VAC25-280-40), Ground Water Standards Applicable by Physiographic Province for the Piedmont (9VAC25-280-50), and Ground Water criteria by Physiographic Province for the Piedmont (9VAC25-280-70).

As part of the revised GWMP, a new upgradient well (MW-4) and a new downgradient well (MW-5) were installed. The previous "upgradient" well (MW-3) was determined to be an inappropriate upgradient well. It was maintained to serve as a downgradient well. In total, the monitoring well network consists of one upgradient well and four downgradient wells. See the attached map for locations of the wells. The approved GWMP established quarterly screening for all of the monitoring wells for the following parameters: aluminum, ammonia, chloride, sulfate, total dissolved solids, total organic carbon, total suspended solids, and pH.

Fifteen (15) monitoring well samples taken from February 2012 to August 2015 were evaluated by DEQ Piedmont Regional Office (PRO) staff. Four downgradient monitoring wells (MW-1, MW-2, MW-3, and MW-5) were evaluated for statistically significant differences against the upgradient or background monitoring well (MW-4). The data sets were evaluated for normality using the Shapiro-Wilk Normality Test and the Shapiro-Wilk Log-Normality Test. Statistically significant differences of the non-normal data sets were then evaluated using the Wilcoxon Rank Sum Test, and the data sets that were determined to be normally distributed were evaluated for significance using the Cochran's Approximation to the Behrens-Fisher Student's T-test. Linear regression trends for each parameter at each monitoring well were also evaluated to determine if the respective parameter concentrations were increasing or decreasing with time. These tests were programmed into Excel by DEQ-PRO staff using formulas and descriptions set forth in EPA's *Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Unified Guidance (EPA 530/R-09-007)*, revised March 2009.

Parameter-Specific Evaluation Results and Conclusions

Aluminum:

- Groundwater Standard: There is no groundwater standard or a groundwater criterion for aluminum. Aluminum monitoring was included in the facility's approved GWMP because the facility used aluminum sulfate (Alum) for many years as a coagulant in its treatment process (1967-1999); therefore, aluminum may be considered a good indicator pollutant for monitoring system integrity.
- Significance to Background Monitoring Well MW-4: MW-1, MW-2, MW-3 and MW-5 were not statistically different from MW-4.
- Linear Regression Trend: MW-4 showed a slight decrease in concentration over time. MW-2 and MW-3 showed a slight increase in concentrations over time. However this increase is based on one observable value for MW-2 and two observable values for MW-3 out of fifteen sampling events. MW-1 and MW-5 showed no trend. Moderately weak degrees of data linearity were demonstrated for MW-4 and MW-2 and a very weak degree of linearity for MW-3. See Table 1 for details.

Table 1

Monitoring Well	Pearson Correlation (R)	Linear Trend	Degree of Linearity
MW-4	-0.43	Slight Decrease	Moderately Weak
MW-1		No Trend, Neutral Slope	
MW-2	0.37	Slight Increase	Moderately Weak
MW-3	0.17	Slight Increase	Very Weak
MW-5		No Trend, Neutral Slope	

- Conclusions: Given that there is neither a groundwater standard nor criterion for aluminum and that MW-2 and MW-3 data sets were not statistically different from the ambient MW-4 data set, no corrective action is warranted for this parameter.

Ammonia:

- Groundwater Standard: The groundwater standard for ammonia is 0.025 mg/L in the Piedmont Physiographic Province. Observed values in MW-1, MW-2 MW-3 and MW-5 exceeded the groundwater standard for ammonia.
- Significance to Background Monitoring Well MW-4: MW-1 and MW-3 were statistically different from MW-4.
- Linear Regression Trend: MW-1, MW-3, and MW-5 showed a slight increase in concentration over time while MW-2 showed a slight decrease. MW-4 showed a neutral slope indicating neither an increase nor decrease over time. MW-1 and MW-2 demonstrated a very weak degree of linearity while MW-3 demonstrated a moderately strong degree of linearity and MW-5 demonstrated a moderately weak degree of linearity. See Table 2 for details.

Table 2

Monitoring Well	Pearson Correlation (R)	Linear Trend	Degree of Linearity
MW-4		No Trend, Neutral Slope	
MW-1	0.18	Slight Increase	Very Weak
MW-2	-0.06	Slight Decrease	Very Weak
MW-3	0.70	Slight Increase	Moderately Strong
MW-5	0.35	Slight Increase	Moderately Weak

- Conclusions: Because all observed concentrations exceeded the groundwater standard for ammonia, MW-1 and MW-3 showed a statistically significant difference from MW-4, and the concentrations for MW-1, MW-3, and MW-5 are increasing slightly over time, corrective action is warranted for this parameter.

Chloride:

- Groundwater Criteria: The groundwater criterion for chloride is in 25 mg/L in the Piedmont Physiographic Province. Observed concentrations in MW-5 exceeded the groundwater standard.
- Significance to Background Monitoring Well MW-4: MW-1, MW-2, MW-3, and MW5 are statistically different from MW-4
- Linear Regression Trend: MW-5 showed a slight increase in concentration over time while the remaining monitoring wells showed a slight decrease. MW-1, MW-3, MW-4, and MW-5 demonstrated moderately weak degrees of linearity and MW-2 demonstrated a very weak degree of linearity.

Table 3

Monitoring Well	Pearson Correlation (R)	Linear Trend	Degree of Linearity
MW-4	-0.30	Slight Decrease	Moderately Weak
MW-1	-0.37	Slight Decrease	Moderately Weak

MW-2	-0.17	Slight Decrease	Very Weak
MW-3	-0.42	Slight Decrease	Moderately Weak
MW-5	0.34	Slight Increase	Moderately Weak

- Conclusions: Because MW-5 concentrations exceeded the groundwater criteria for chloride, MW-1, MW-2, MW-3, and MW-5 showed a statistically significant difference from MW-4, and the concentrations in MW-5 are increasing over time, corrective action is warranted for this parameter.

Sulfate:

- Groundwater Criteria: The groundwater criterion for sulfate is 25 mg/L in the Piedmont Physiographic Province. Sulfate monitoring was also included in the facility's approved GWMP because the facility uses aluminum sulfate (Alum) as a coagulant in its treatment process; therefore, sulfate may be considered a possible indicator for monitoring system integrity. Exceedances of the sulfate criteria were observed in MW-3 and MW-5. Over 93% of the samples taken from MW-3 and MW-5 had concentrations above the criteria.
- Significance to Background Monitoring Well MW-4: MW-1 and MW-2 data were not significantly different from MW-4 data. However, MW-3 and MW-5 data were significantly different from MW-4.
- Linear Regression Trend: MW-2, MW-3, and MW-4 showed a slight decrease in concentrations over time while MW-1 and MW-5 showed a slight increase over time. The degree of data linearity was very weak for MW-1, MW-2, and MW-4, moderately weak for MW-3 and moderately strong for MW-5. See Table 4 for details.

Table 4

Monitoring Well	Pearson Correlation (R)	Linear Trend	Degree of Linearity
MW-4	-0.11	Slight Decrease	Very Weak
MW-1	0.07	Slight Increase	Very Weak
MW-2	-0.25	Slight Decrease	Very Weak
MW-3	0.37	Slight Increase	Moderately Weak
MW-5	-0.51	Slight Decrease	Moderately Strong

- Conclusions: Because MW-3 and MW-5 concentrations exceeded the groundwater criteria for sulfate, MW-3 and MW-5 showed a statistically significant difference from MW-4, and the concentrations in MW-1 and MW-3 are increasing over time, corrective action is warranted for this parameter.

Total Dissolved Solids (TDS):

- Groundwater Criteria: The groundwater criterion for TDS is 250 mg/L in the Piedmont Physiographic Province. All of the samples analyzed from MW-1, MW-2, and MW-5 exceeded the groundwater criterion for TDS. Sixty percent of the samples from MW3 exceeded the criterion.
- Significance to Background Monitoring Well MW-4: MW-1, MW-2, MW-3, and MW-5 showed statistically significant differences from MW-4.
- Linear Regression Trend: MW-1, MW-2, MW-3, and MW-5 showed a slight increase in concentration over time while MW-4 showed a slight decrease. The degree of linearity is very weak for MW-1, moderately weak for MW-3 and MW-4, and moderately strong for MW-2 and MW-5. See Table 5 for details.

Table 5

Monitoring Well	Pearson Correlation (R)	Linear Trend	Degree of Linearity
MW-4	-0.45	Slight Decrease	Moderately Weak
MW-1	0.18	Slight Increase	Very Weak
MW-2	0.63	Slight Increase	Moderately Strong
MW-3	0.42	Slight Increase	Moderately Weak
MW-5	0.52	Slight Increase	Moderately Strong

- Conclusions: Because MW-1, MW-2, MW-3, and MW-5 concentrations exceeded the groundwater criteria for TDS, MW-1, MW-2, MW-3 and MW-5 showed a statistically significant difference from MW-4, and the concentrations in MW-1, MW-2, MW-3, and MW-5 are increasing over time, corrective action is warranted for this parameter.

Total Organic Carbon (TOC):

- Groundwater Criteria: The groundwater criterion for TOC is 10 mg/L in the Piedmont Physiographic Province. All of the samples analyzed for MW-1 exceeded the groundwater criterion for TOC. Over 13% of the samples analyzed for MW-3 exceeded the criterion.

- Significance to Background Monitoring Well MW-4: MW-1, MW-2,MW-3, and MW-5 showed statistically significant differences from MW-4.
- Linear Regression Trend: MW-1, MW-2, and MW-5 showed slight increases in concentration over time while MW-3 and MW-4 showed slight decreases. The degree of linearity is very weak for MW-3 and MW-4, moderately weak for MW-1 and MW-5, and moderately strong for MW-2. See Table 6 for details.

Table 6

Monitoring Well	Pearson Correlation (R)	Linear Trend	Degree of Linearity
MW-4	-0.22	Slight Decrease	Very Weak
MW-1	0.26	Slight Increase	Moderately Weak
MW-2	0.61	Slight Increase	Moderately Strong
MW-3	-0.10	Slight Decrease	Very Weak
MW-5	0.35	Slight Increase	Moderately Weak

- Conclusions: Because MW-1 and MW-3 concentrations exceeded the groundwater criteria for TOC, MW-1 MW-2, MW-3, and MW-5 showed a statistically significant difference from MW-4, and the concentrations in MW-1, MW-2, and MW-5 are increasing over time, corrective action is warranted for this parameter.

Total Suspended Solids (TSS):

- Groundwater Standard/Criteria: No groundwater standards or criteria exist for TSS.
- Significance to Background Monitoring Well MW-4: None of the data from the monitoring wells was significantly different from MW-4.
- Linear Regression Trend: MW-1, MW-2, MW-4, and MW-5 showed slight decreases in concentration over time while MW-3 showed a slight increase. The degree of linearity was very weak for MW-1 and MW-3, moderately weak for MW-2 and MW-5, and moderately strong for MW-4. See Table 7 for details.

Table 7

Monitoring Well	Pearson Correlation (R)	Linear Trend	Degree of Linearity
MW-4	-0.58	Slight Decrease	Moderately Strong
MW-1	-0.12	Slight Decrease	Very Weak
MW-2	-0.32	Slight Decrease	Moderately Weak
MW-3	0.11	Slight Increase	Very Weak
MW-5	-0.49	Slight Decrease	Moderately Weak

- Conclusions: Given that there is no groundwater standard or criterion for TSS, none of the monitoring wells were significantly different from MW-4, and only MW-3 showed a slight increase in concentration over time, no corrective action is warranted for this parameter.

pH:

- Groundwater Standard: The pH Groundwater Standard is 5.5 – 8.5 standard units (S.U.) for the Piedmont Physiographic Province. None of the samples analyzed exceeded the pH standards.
- Significance to Background Monitoring Well MW-4: Data sets from MW-1 and MW-2 were statistically different than the MW-4 data set.
- Linear Regression Trend: MW-1 and MW-2 showed a slight increase in concentration over time while MW-3, MW-4, and MW-5 showed a slight decrease.

Table 8

Monitoring Well	R^2	Linear Trend	Degree of Linearity
MW-4	0.56	Slight Decrease	Moderately Strong
MW-1	0.01	Slight Increase	Very Weak
MW-2	0.05	Slight Increase	Very Weak
MW-3	0.003	Slight Decrease	Very Weak
MW-5	0.11	Slight Decrease	Very Weak

- Conclusions: Given that MW-1 and MW-2 are significantly different from MW-4, and that MW-1 and MW-2 are increasing while MW-4 is decreasing, corrective action is warranted for this parameter.

Recommendation:
The continuation of quarterly monitoring and reporting of groundwater sampling at MW-1, MW-2, MW-3, MW-4, and MW-5 is recommended for aluminum, ammonia, chloride, sulfate, TDS, TOC, TSS, and pH. Corrective action is warranted for ammonia, chloride, sulfate, TDS, TOC, and pH.

Groundwater Monitoring Data Analysis (v.3)

Facility Name:	Addison-Evans
Permit No.:	VA0006254
Monitoring Parameter:	Aluminum
Applicable GW Standard (if none leave blank):	
Applicable GW Criteria (if none leave blank):	
Concentration Units (all data):	mg/L

		Data Entry					
	Well Designation ►	MW4	MW1	MW2	MW3	MW5	
	Sample or Report Date (ascending)	Background Well Data	Compliance Well #1	Compliance Well #2	Compliance Well #3	Compliance Well #4	Compliance Well #5
1	2/15/2012	0.1	0	0	0	0	
2	5/17/2012	0	0	0	0	0	
3	8/15/2012	0	0	0	0	0	
4	11/27/2012	0	0	0	0	0	
5	2/19/2013	0.06	0	0	0	0	
6	5/20/2013	0	0	0	0.14	0	
7	8/26/2013	0	0	0	0	0	
8	11/13/2013	0	0	0	0	0	
9	2/12/2014	0.055	0	0	0	0	
10	5/14/2014	0	0	0	0	0	
11	8/14/2014	0	0	0	0	0	
12	11/12/2014	0	0	0	0	0	
13	2/11/2015	0	0	0	0.173	0	
14	5/13/2015	0	0	0.053	0	0	
15	8/13/2015	0	0	0	0	0	
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Results: Significance to Background **

		Distribution Tests		Non-normal Test	Normal Tests	
		Shapiro-Wilk Normality Test	Shapiro-Wilk Log-Normality Test	Wilcoxon Rank Sum Test	T-test	T-test (lognormal)
MW4	Background Well	Not normal		N/A		
MW1	Compliance Well #1			Not Significant	Not Significant	
MW2	Compliance Well #2	Not normal		Not Significant	Not Significant	
MW3	Compliance Well #3	Not normal		Not Significant	Not Significant	
MW5	Compliance Well #4			Not Significant	Not Significant	
	Compliance Well #5					

** Please note that the above cells will appear blank in cases where a test cannot be conducted due to lack of data, or if the test assumptions are invalid due to lack of data variation.

Results: Linear Regression Trend Analysis and Interpretation of Data

		Regression Line Slope	Pearson Correlation (R)	Interpretation	
				Linear Trend	Degree of Data Linearity
MW4	Background Well	-3.26861E-05	-0.42622698	Slight Decrease	Moderately Weak
MW1	Compliance Well #1	0		No trend, slope is neutral	
MW2	Compliance Well #2	1.25058E-05	0.370646558	Slight Increase	Moderately Weak
MW3	Compliance Well #3	2.30667E-05	0.168812197	Slight Increase	Very Weak
MW5	Compliance Well #4	0		No trend, slope is neutral	
	Compliance Well #5				

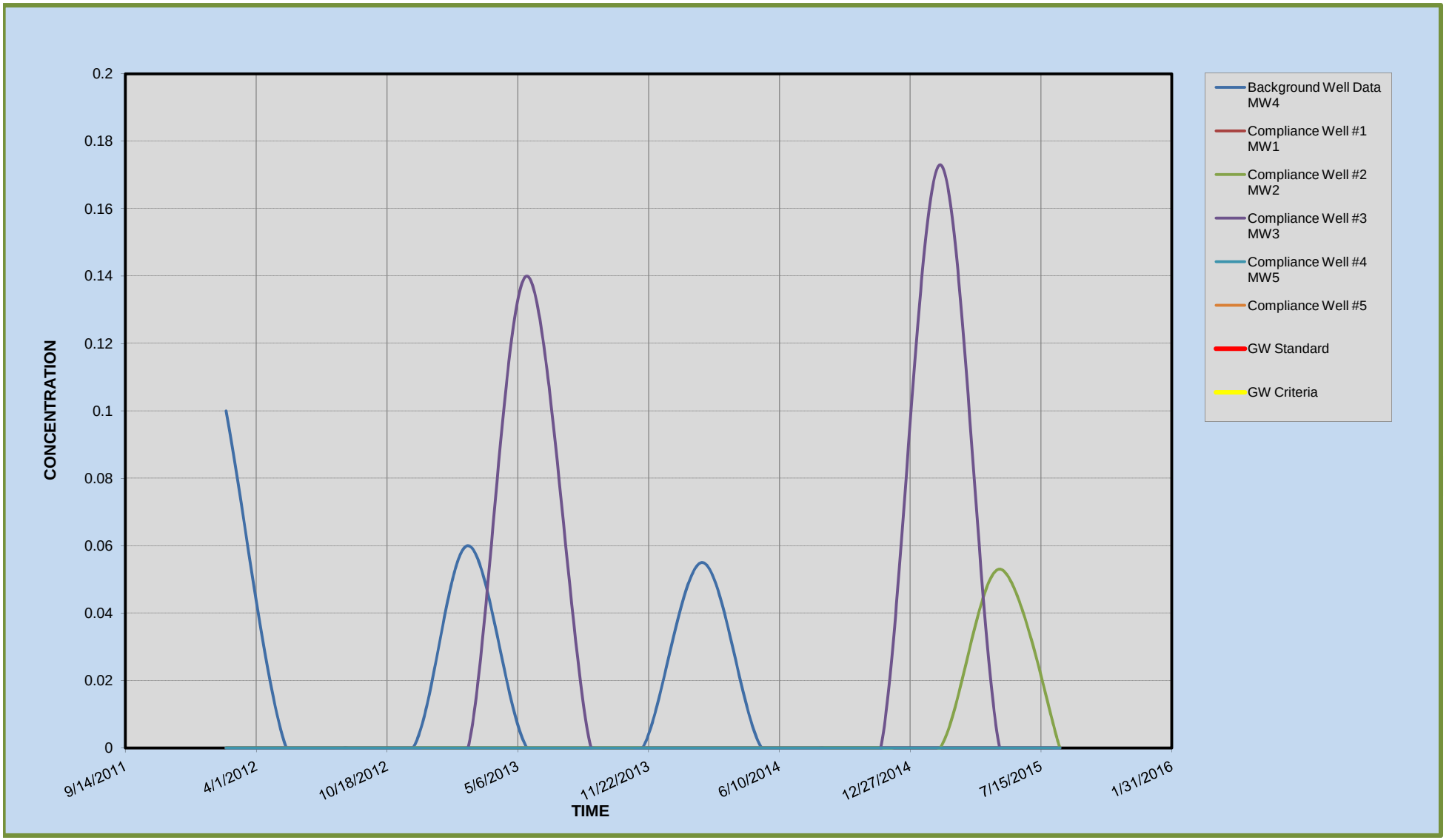
Results: Groundwater Standards/Criteria Comparison

		Groundwater Standard		Groundwater Criteria		Total No. of Data Points
		No. Violations of GW Standard	% Violations of GW Standard	No. Violations of GW Criteria	% Violations of GW Criteria	
MW4	Background Well					15
MW1	Compliance Well #1					15
MW2	Compliance Well #2					15
MW3	Compliance Well #3					15
MW5	Compliance Well #4					15
	Compliance Well #5					

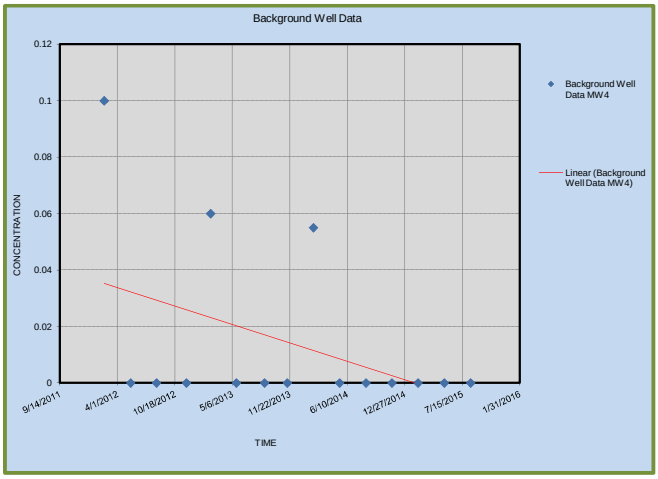
Results: Basic Statistics (less-than values ignored)

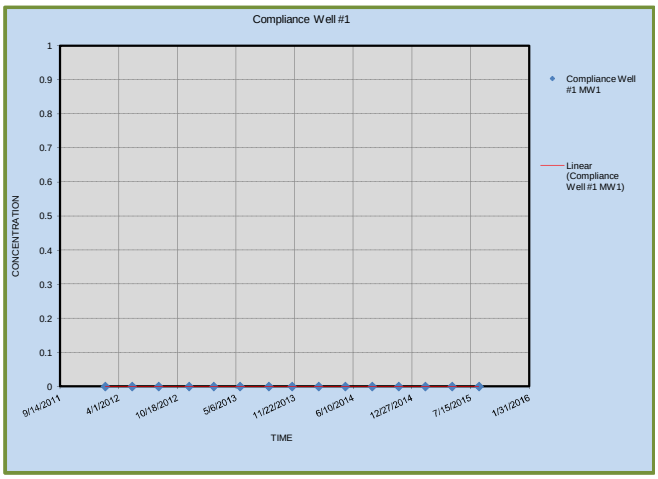
		Maximum Value	Minimum Value	Average		
MW4	Background Well	0.100	0.000	0.014		
MW1	Compliance Well #1	0.000	0.000	0.000		
MW2	Compliance Well #2	0.053	0.000	0.004		
MW3	Compliance Well #3	0.173	0.000	0.021		
MW5	Compliance Well #4	0.000	0.000	0.000		
	Compliance Well #5					

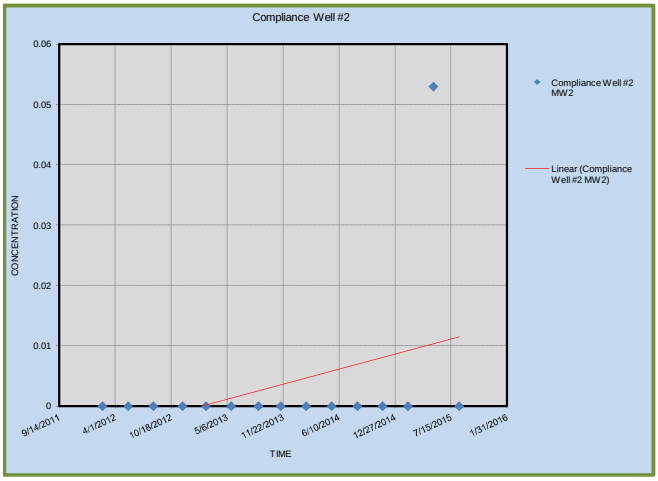
Addison-Evans: Groundwater Monitoring Data for Aluminum

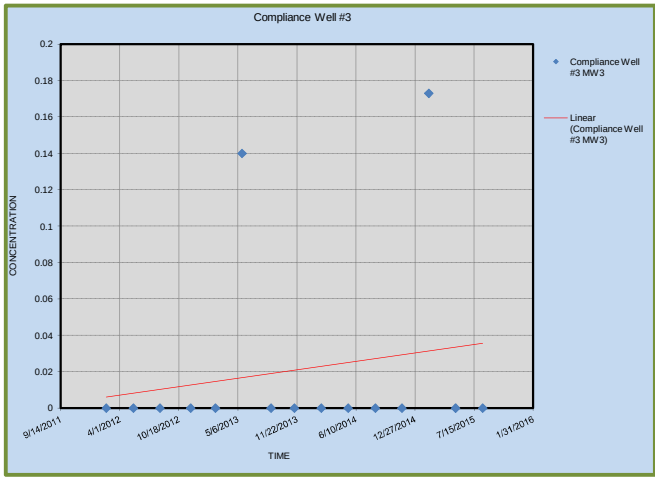


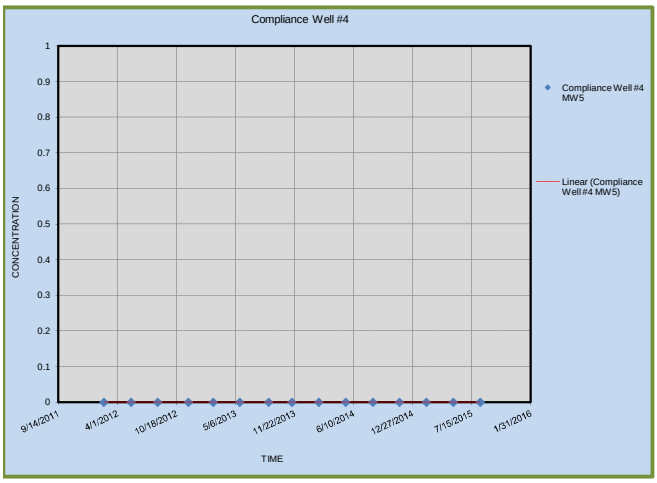
Addison-Evans: Groundwater Monitoring Regression Trends for Aluminum

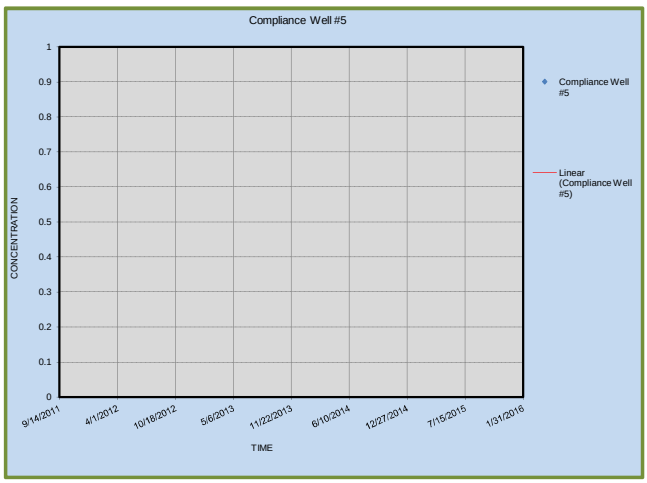












Groundwater Monitoring Data Analysis (v.3)

Facility Name:	Addison-Evans
Permit No.:	VA0006254
Monitoring Parameter:	Chloride
Applicable GW Standard (if none leave blank):	25
Applicable GW Criteria (if none leave blank):	
Concentration Units (all data):	mg/L

		Data Entry					
	Well Designation ►	MW4	MW1	MW2	MW3	MW5	
	Sample or Report Date (ascending)	Background Well Data	Compliance Well #1	Compliance Well #2	Compliance Well #3	Compliance Well #4	Compliance Well #5
1	2/15/2012	6.5	16.1	15.7	10	23	
2	5/17/2012	7	18.3	17.6	8.5	26.7	
3	8/15/2012	5.2	17.1	16.9	9.8	34.8	
4	11/27/2012	8.4	21.8	17.3	8.6	12.2	
5	2/19/2013	4.6	14.6	18	7.3	13.4	
6	5/20/2013	6.4	14.7	16.9	7.4	15.2	
7	8/26/2013	6.7	17.2	13.4	4.4	20.7	
8	11/13/2013	7.1	16	16.5	5.6	21.8	
9	2/12/2014	6.4	9.9	19.3	10.8	22.4	
10	5/14/2014	4.6	11	17.6	7.9	18.6	
11	8/14/2014	4	15.8	17.5	5.4	16.3	
12	11/12/2014	4.7	16.4	17.3	8.3	34.9	
13	2/11/2015	5	13.4	6.9	5.5	29.9	
14	5/13/2015	6.9	14	17.7	7	35.8	
15	8/13/2015	6.3	17.4	17.6	7.4	27.3	
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Results: Significance to Background **

		Distribution Tests		Non-normal Test	Normal Tests	
		Shapiro-Wilk Normality Test	Shapiro-Wilk Log-Normality Test	Wilcoxon Rank Sum Test	T-test	T-test (lognormal)
MW4	Background Well	Not normal	Not normal	N/A		
MW1	Compliance Well #1	Normal	Normal	Significant	Significant	Significant
MW2	Compliance Well #2	Not normal	Not normal	Significant	Significant	Significant
MW3	Compliance Well #3	Not normal	Not normal	Significant	Significant	Significant
MW5	Compliance Well #4	Normal	Normal	Significant	Significant	Significant
	Compliance Well #5					

** Please note that the above cells will appear blank in cases where a test cannot be conducted due to lack of data, or if the test assumptions are invalid due to lack of data variation.

Results: Linear Regression Trend Analysis and Interpretation of Data

		Regression Line Slope	Pearson Correlation (R)	Interpretation	
				Linear Trend	Degree of Data Linearity
MW4	Background Well	-0.000914258	-0.301490901	Slight Decrease	Moderately Weak
MW1	Compliance Well #1	-0.002641893	-0.369508125	Slight Decrease	Moderately Weak
MW2	Compliance Well #2	-0.001201299	-0.166378879	Slight Decrease	Very Weak
MW3	Compliance Well #3	-0.001917393	-0.423306115	Slight Decrease	Moderately Weak
MW5	Compliance Well #4	0.006523011	0.337317634	Slight Increase	Moderately Weak
	Compliance Well #5				

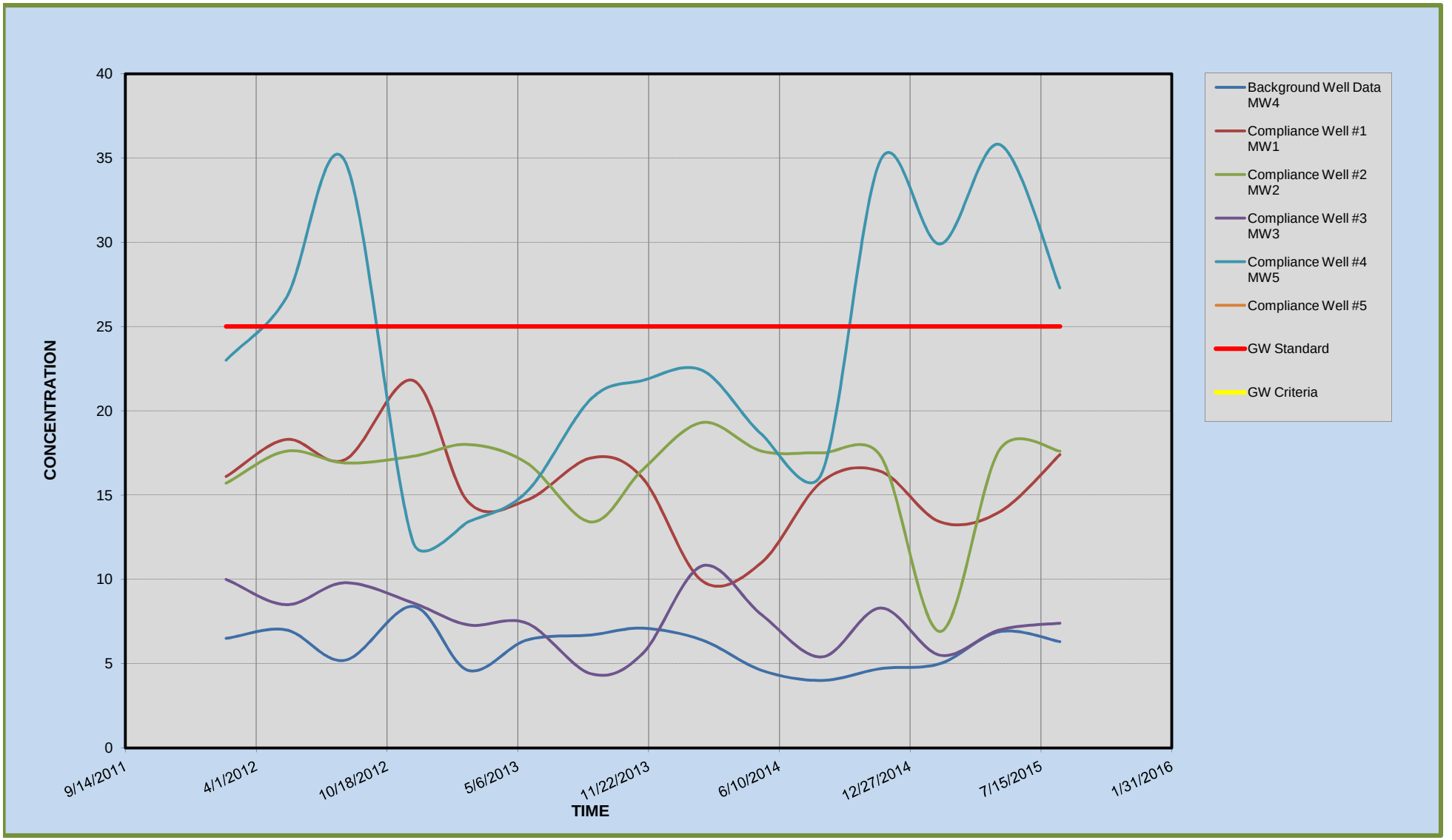
Results: Groundwater Standards/Criteria Comparison

		Groundwater Standard		Groundwater Criteria		Total No. of Data Points
		No. Violations of GW Standard	% Violations of GW Standard	No. Violations of GW Criteria	% Violations of GW Criteria	
MW4	Background Well	0	0%			15
MW1	Compliance Well #1	0	0%			15
MW2	Compliance Well #2	0	0%			15
MW3	Compliance Well #3	0	0%			15
MW5	Compliance Well #4	6	40%			15
	Compliance Well #5					

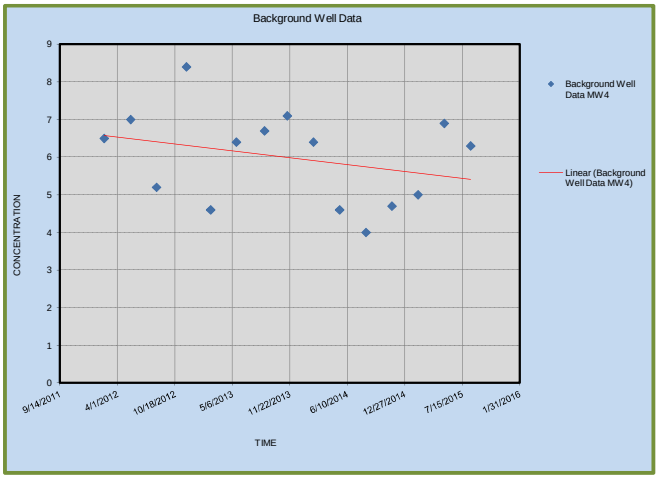
Results: Basic Statistics (less-than values ignored)

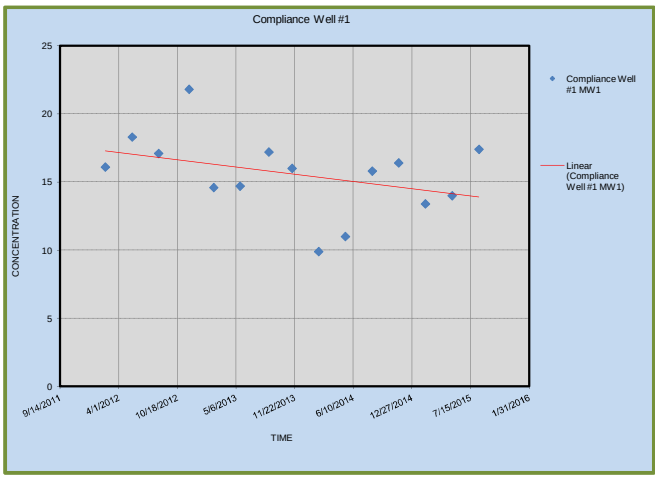
		Maximum Value	Minimum Value	Average		
MW4	Background Well	8.400	4.000	5.987		
MW1	Compliance Well #1	21.800	9.900	15.580		
MW2	Compliance Well #2	19.300	6.900	16.413		
MW3	Compliance Well #3	10.800	4.400	7.593		
MW5	Compliance Well #4	35.800	12.200	23.533		
	Compliance Well #5					

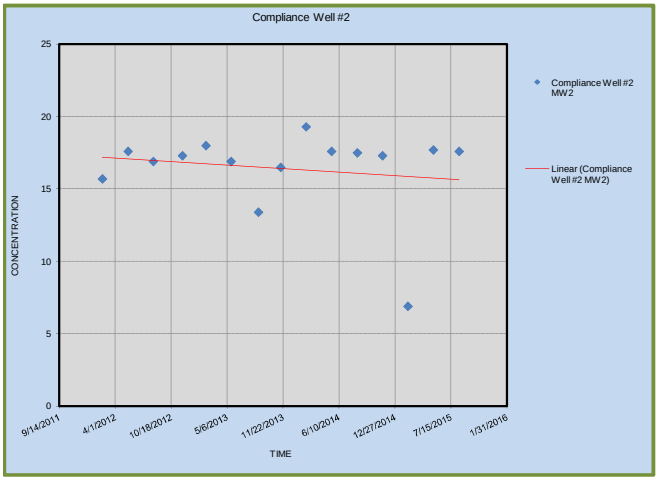
Addison-Evans: Groundwater Monitoring Data for Chloride

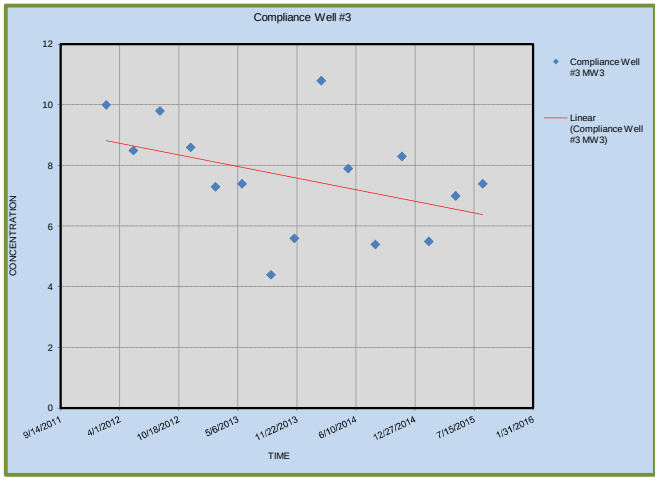


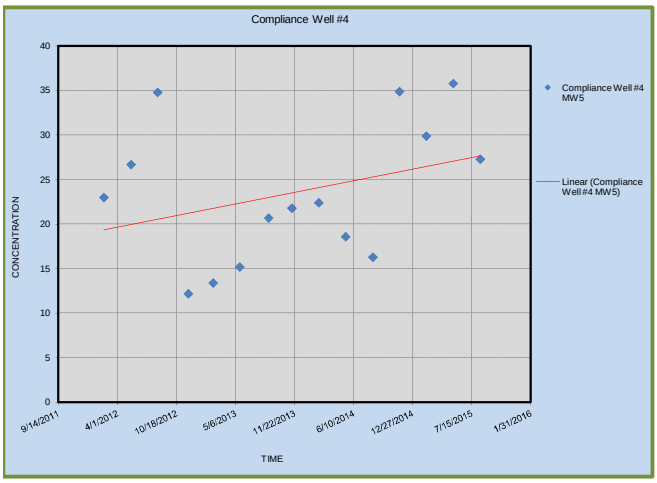
Addison-Evans: Groundwater Monitoring Regression Trends for Chloride

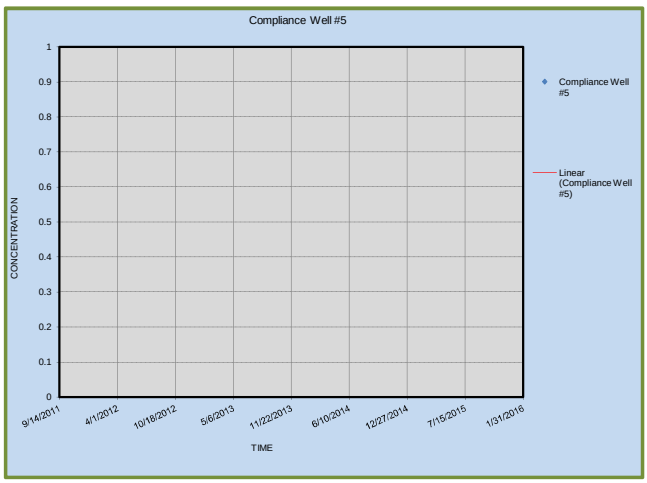












Groundwater Monitoring Data Analysis (v.3)

Facility Name:	Addison-Evans
Permit No.:	VA0006254
Monitoring Parameter:	Ammonia
Applicable GW Standard (if none leave blank):	0.025
Applicable GW Criteria (if none leave blank):	
Concentration Units (all data):	mg/L

	Well Designation ►	Data Entry					
		MW4	MW1	MW2	MW3	MW5	
	Sample or Report Date (ascending)	Background Well Data	Compliance Well #1	Compliance Well #2	Compliance Well #3	Compliance Well #4	Compliance Well #5
1	2/15/2012	0	1.9	0	0	0	
2	5/17/2012	0	1.71	0	0	0	
3	8/15/2012	0	0.34	0	0	0	
4	11/27/2012	0	0.45	0	0	0	
5	2/19/2013	0	1.4	0	0	0	
6	5/20/2013	0	0.82	0	0.12	0	
7	8/26/2013	0	0.62	0.1	0.26	0	
8	11/13/2013	0	0.4	0	0.37	0	
9	2/12/2014	0	2.06	0	0.16	0	
10	5/14/2014	0	2.2	0	0	0	
11	8/14/2014	0	0.75	0	0	0.42	
12	11/12/2014	0	0.51	0	0.62	0	
13	2/11/2015	0	2.78	0	0.47	0.11	
14	5/13/2015	0	1.59	0	0.33	0.1	
15	8/13/2015	0	1.14	0	0.38	0	
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Results: Significance to Background **

		Distribution Tests		Non-normal Test	Normal Tests	
		Shapiro-Wilk Normality Test	Shapiro-Wilk Log-Normality Test	Wilcoxon Rank Sum Test	T-test	T-test (lognormal)
MW4	Background Well			N/A		
MW1	Compliance Well #1	Normal	Normal	Significant	Significant	
MW2	Compliance Well #2	Not normal		Not Significant	Not Significant	
MW3	Compliance Well #3	Not normal		Significant	Significant	
MW5	Compliance Well #4	Not normal		Not Significant	Not Significant	
	Compliance Well #5					

** Please note that the above cells will appear blank in cases where a test cannot be conducted due to lack of data, or if the test assumptions are invalid due to lack of data variation.

Results: Linear Regression Trend Analysis and Interpretation of Data

		Regression Line Slope	Pearson Correlation (R)	Interpretation	
				Linear Trend	Degree of Data Linearity
MW4	Background Well	0		No trend, slope is neutral	
MW1	Compliance Well #1	0.000333486	0.176158284	Slight Increase	Very Weak
MW2	Compliance Well #2	-3.5433E-06	-0.055658372	Slight Decrease	Very Weak
MW3	Compliance Well #3	0.00035949	0.696503482	Slight Increase	Moderately Strong
MW5	Compliance Well #4	9.47016E-05	0.346484447	Slight Increase	Moderately Weak
	Compliance Well #5				

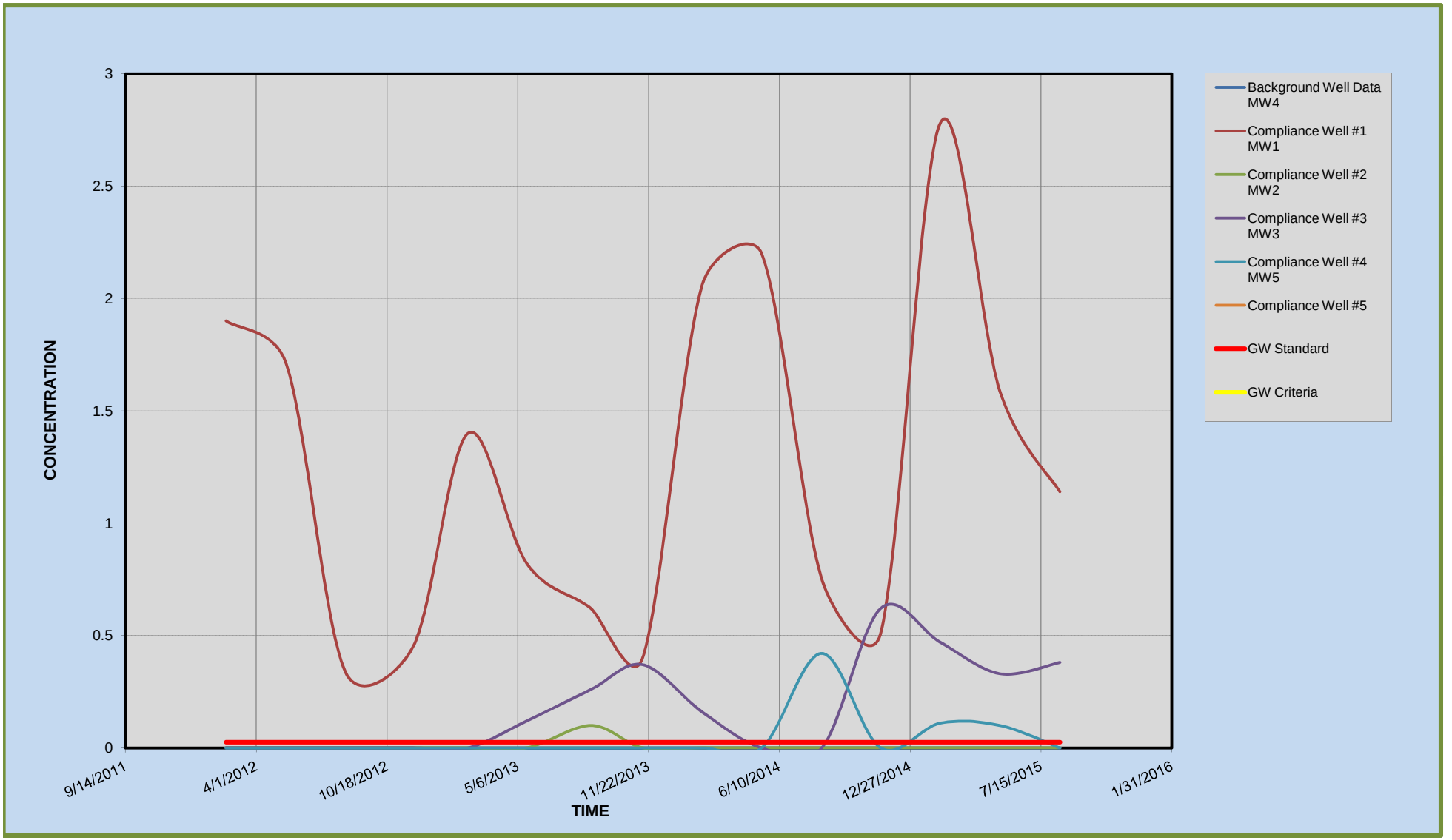
Results: Groundwater Standards/Criteria Comparison

		Groundwater Standard		Groundwater Criteria		Total No. of Data Points
		No. Violations of GW Standard	% Violations of GW Standard	No. Violations of GW Criteria	% Violations of GW Criteria	
MW4	Background Well	0	0%			15
MW1	Compliance Well #1	15	100%			15
MW2	Compliance Well #2	1	6.7%			15
MW3	Compliance Well #3	8	53.3%			15
MW5	Compliance Well #4	3	20%			15
	Compliance Well #5					

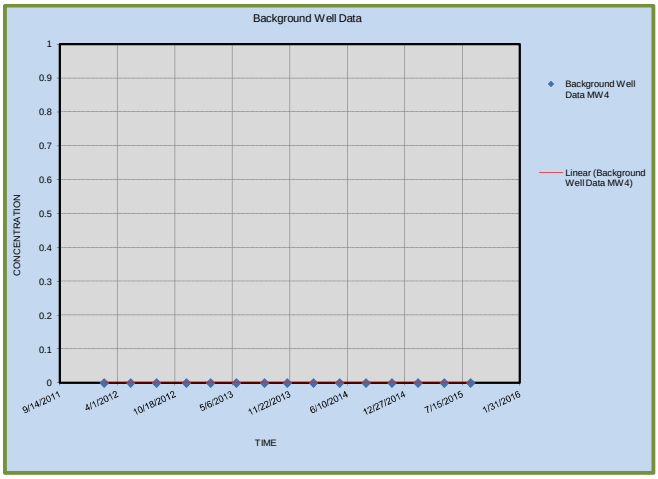
Results: Basic Statistics (less-than values ignored)

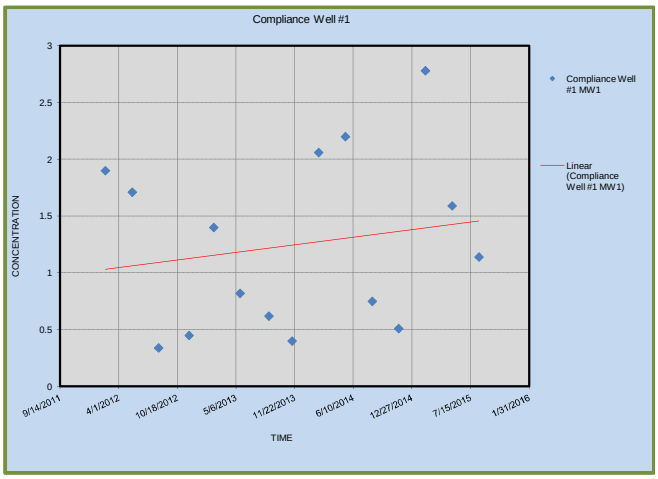
		Maximum Value	Minimum Value	Average		
MW4	Background Well	0.000	0.000	0.000		
MW1	Compliance Well #1	2.780	0.340	1.245		
MW2	Compliance Well #2	0.100	0.000	0.007		
MW3	Compliance Well #3	0.620	0.000	0.181		
MW5	Compliance Well #4	0.420	0.000	0.042		
	Compliance Well #5					

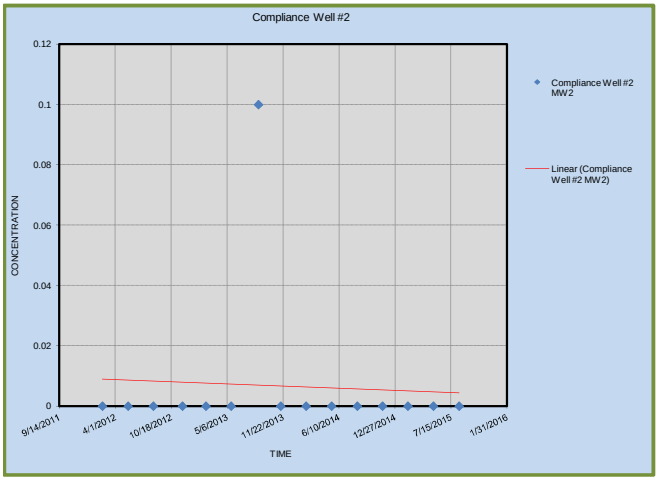
Addison-Evans: Groundwater Monitoring Data for Ammonia

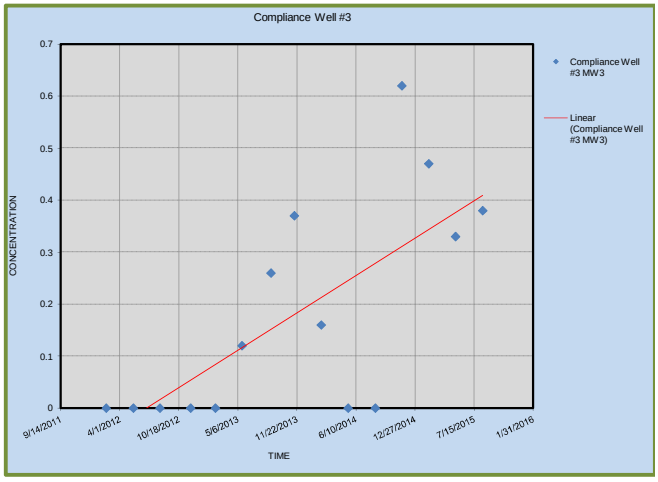


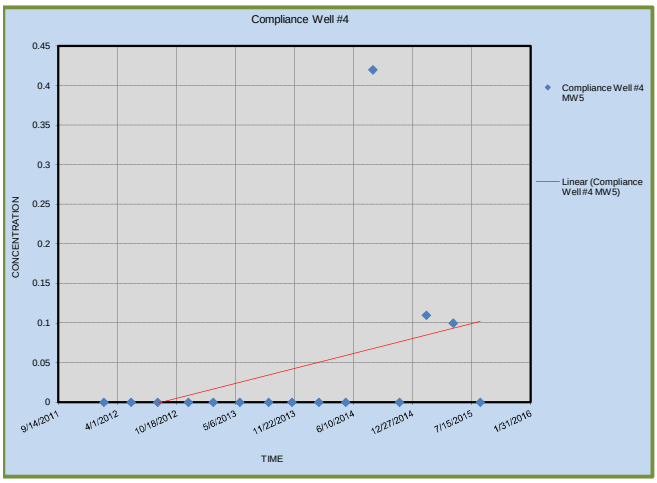
Addison-Evans: Groundwater Monitoring Regression Trends for Ammonia

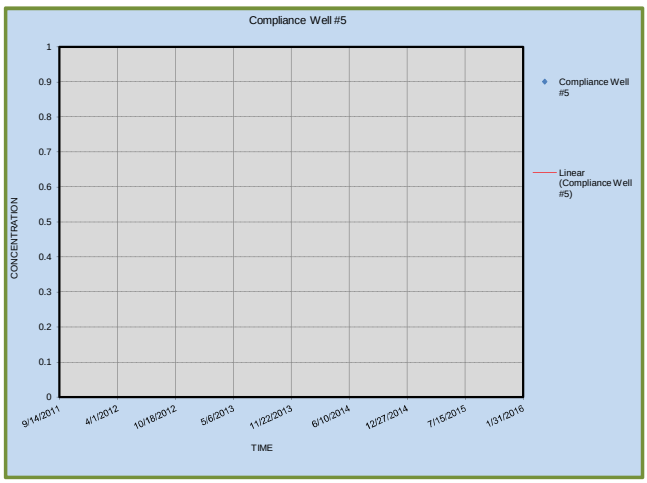












Groundwater Monitoring Data Analysis (v.3)

Facility Name:	Addison-Evans
Permit No.:	VA0006254
Monitoring Parameter:	Sulfate
Applicable GW Standard (if none leave blank):	25
Applicable GW Criteria (if none leave blank):	
Concentration Units (all data):	mg/L

		Data Entry					
	Well Designation ►	MW4	MW1	MW2	MW3	MW5	
	Sample or Report Date (ascending)	Background Well Data	Compliance Well #1	Compliance Well #2	Compliance Well #3	Compliance Well #4	Compliance Well #5
1	2/15/2012	19.4	0	10.1	41.9	47.9	
2	5/17/2012	13.6	0	8.8	48.2	51.4	
3	8/15/2012	5.6	1	9	43.9	43.7	
4	11/27/2012	8.8	0	7.8	37.9	37.8	
5	2/19/2013	4.7	0	7.2	61.4	41.9	
6	5/20/2013	10.6	0	6.4	71.4	40.6	
7	8/26/2013	11.1	1.7	5.4	230	42.6	
8	11/13/2013	10.3	1	6	121	34.5	
9	2/12/2014	6.4	9.9	19.3	10.8	22.4	
10	5/14/2014	12.1	1	9.5	158	52.4	
11	8/14/2014	11.3	0	6.4	133	35.2	
12	11/12/2014	9.9	0	7.6	76.4	35.2	
13	2/11/2015	11.1	1.1	3.3	86.4	34.4	
14	5/13/2015	10.6	0	6.1	110	41.6	
15	8/13/2015	11.4	0	6.2	97.8	31.2	
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Results: Significance to Background **

		Distribution Tests		Non-normal Test	Normal Tests	
		Shapiro-Wilk Normality Test	Shapiro-Wilk Log-Normality Test	Wilcoxon Rank Sum Test	T-test	T-test (lognormal)
MW4	Background Well	Not normal	Not normal	N/A		
MW1	Compliance Well #1	Not normal		Not Significant	Not Significant	
MW2	Compliance Well #2	Not normal	Not normal	Not Significant	Not Significant	Not Significant
MW3	Compliance Well #3	Normal	Normal	Significant	Significant	Significant
MW5	Compliance Well #4	Not normal	Not normal	Significant	Significant	Significant
	Compliance Well #5					

** Please note that the above cells will appear blank in cases where a test cannot be conducted due to lack of data, or if the test assumptions are invalid due to lack of data variation.

Results: Linear Regression Trend Analysis and Interpretation of Data

		Regression Line Slope	Pearson Correlation (R)	Interpretation	
				Linear Trend	Degree of Data Linearity
MW4	Background Well	-0.000966955	-0.112117687	Slight Decrease	Very Weak
MW1	Compliance Well #1	0.000413941	0.066707228	Slight Increase	Very Weak
MW2	Compliance Well #2	-0.002197609	-0.247479079	Slight Decrease	Very Weak
MW3	Compliance Well #3	0.051615527	0.37342731	Slight Increase	Moderately Weak
MW5	Compliance Well #4	-0.009836463	-0.506260929	Slight Decrease	Moderately Strong
	Compliance Well #5				

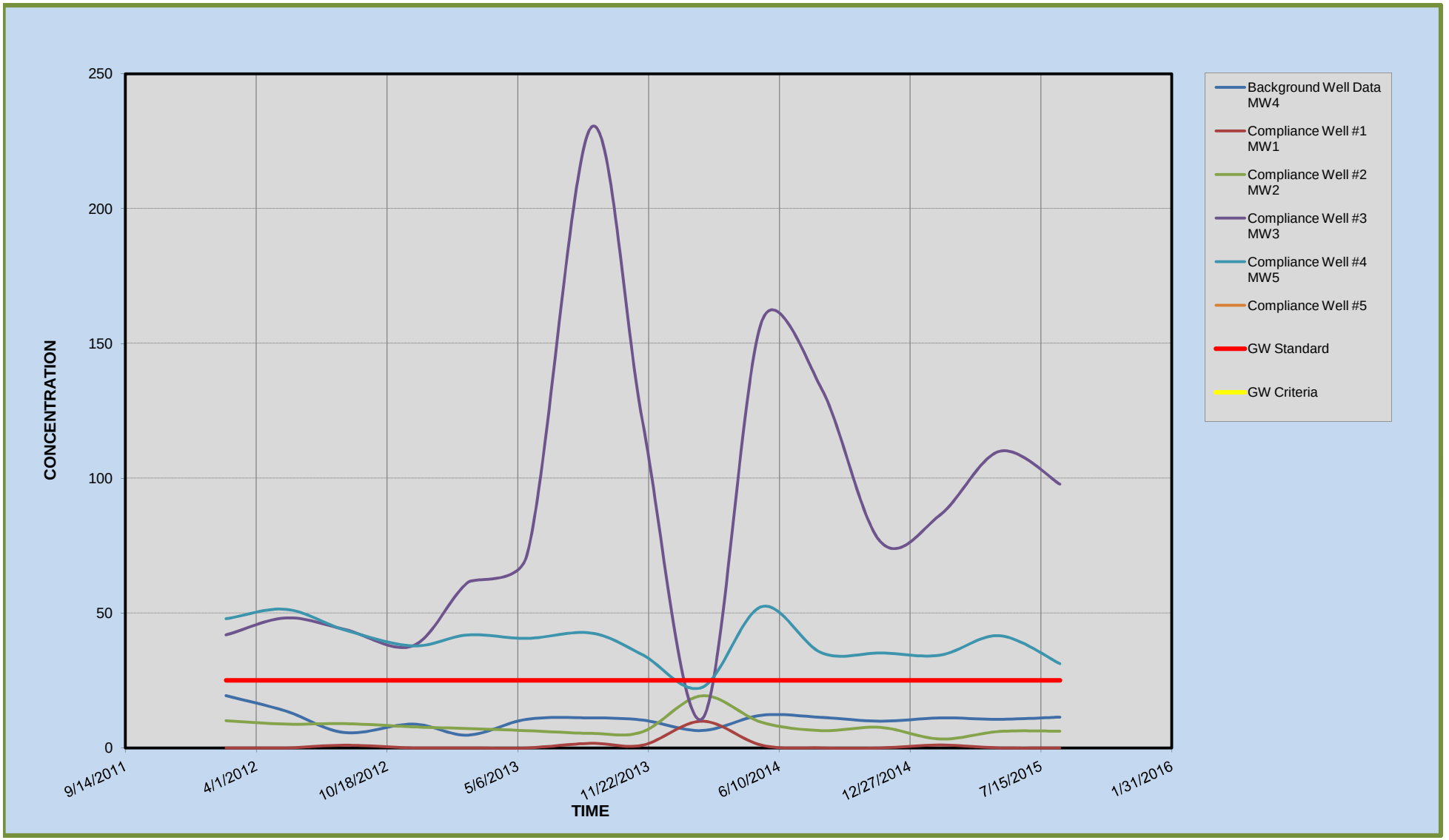
Results: Groundwater Standards/Criteria Comparison

		Groundwater Standard		Groundwater Criteria		Total No. of Data Points
		No. Violations of GW Standard	% Violations of GW Standard	No. Violations of GW Criteria	% Violations of GW Criteria	
MW4	Background Well	0	0%			15
MW1	Compliance Well #1	0	0%			15
MW2	Compliance Well #2	0	0%			15
MW3	Compliance Well #3	14	93.3%			15
MW5	Compliance Well #4	14	93.3%			15
	Compliance Well #5					

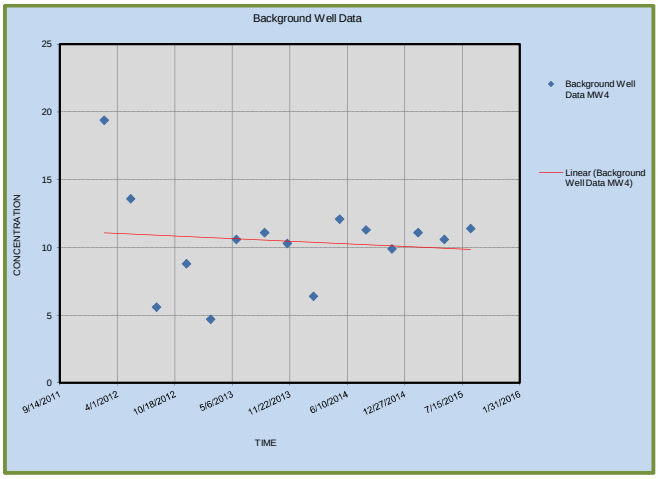
Results: Basic Statistics (less-than values ignored)

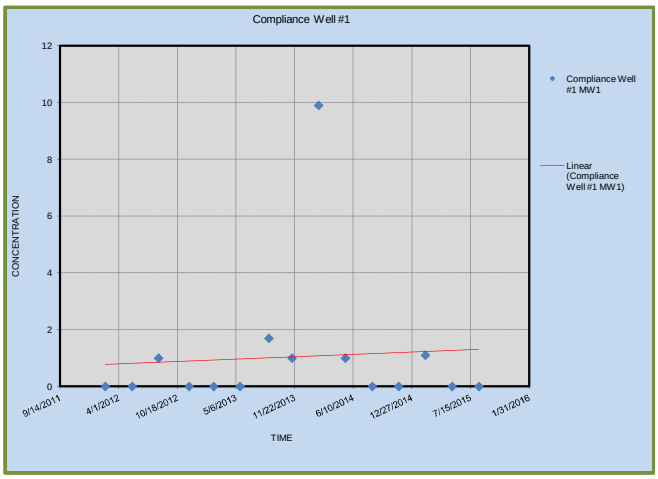
		Maximum Value	Minimum Value	Average		
MW4	Background Well	19.400	4.700	10.460		
MW1	Compliance Well #1	9.900	0.000	1.047		
MW2	Compliance Well #2	19.300	3.300	7.940		
MW3	Compliance Well #3	230.000	10.800	88.540		
MW5	Compliance Well #4	52.400	22.400	39.520		
	Compliance Well #5					

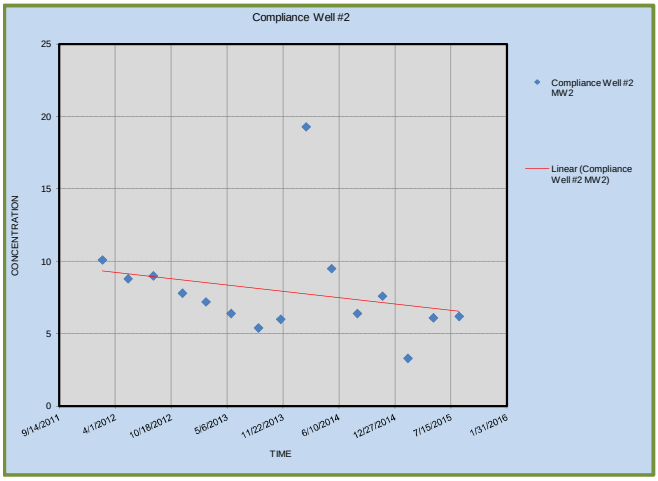
Addison-Evans: Groundwater Monitoring Data for Sulfate

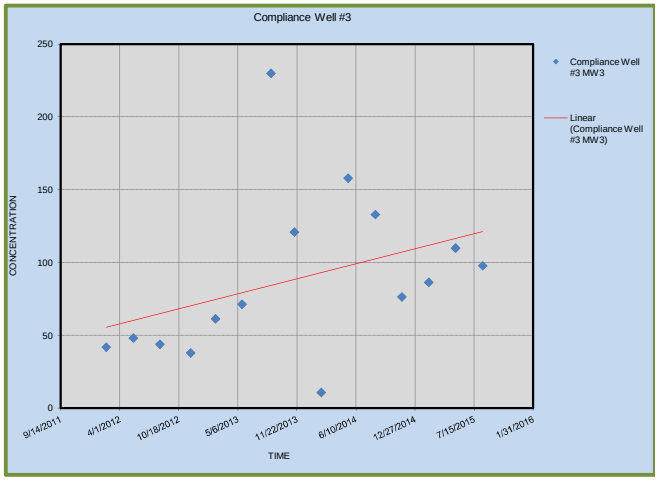


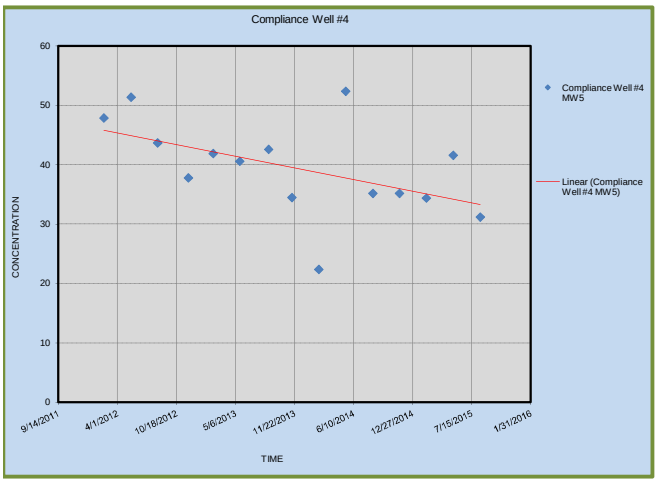
Addison-Evans: Groundwater Monitoring Regression Trends for Sulfate

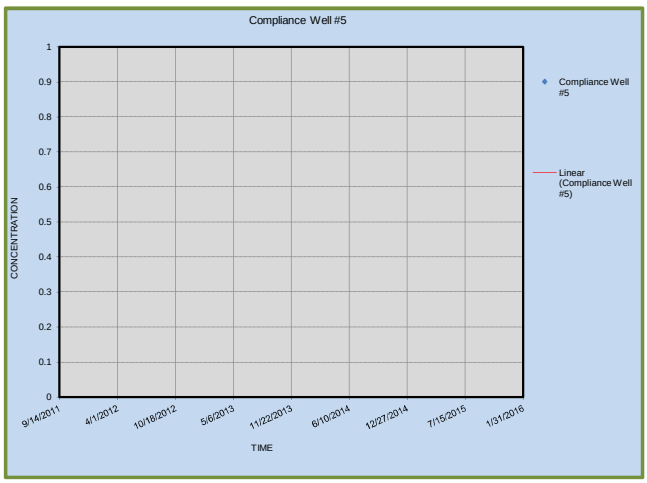












Groundwater Monitoring Data Analysis (v.3)

Facility Name:	Addison-Evans
Permit No.:	VA0006254
Monitoring Parameter:	TDS
Applicable GW Standard (if none leave blank):	250
Applicable GW Criteria (if none leave blank):	
Concentration Units (all data):	mg/L

		Data Entry					
	Well Designation ►	MW4	MW1	MW2	MW3	MW5	
	Sample or Report Date (ascending)	Background Well Data	Compliance Well #1	Compliance Well #2	Compliance Well #3	Compliance Well #4	Compliance Well #5
1	2/15/2012	178	340	264	152	284	
2	5/17/2012	200	350	278	192	332	
3	8/15/2012	148	343	301	151	321	
4	11/27/2012	92	295	284	171	256	
5	2/19/2013	68	317	310	214	282	
6	5/20/2013	75	325	301	424	308	
7	8/26/2013	85	362	298	521	292	
8	11/13/2013	51	305	259	310	301	
9	2/12/2014	68	275	320	408	300	
10	5/14/2014	57	346	317	349	340	
11	8/14/2014	79	354	312	361	350	
12	11/12/2014	171	352	324	285	311	
13	2/11/2015	107	316	296	245	305	
14	5/13/2015	63	314	309	295	346	
15	8/13/2015	92	397	328	309	338	
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Results: Significance to Background **

		Distribution Tests		Non-normal Test	Normal Tests	
		Shapiro-Wilk Normality Test	Shapiro-Wilk Log-Normality Test	Wilcoxon Rank Sum Test	T-test	T-test (lognormal)
MW4	Background Well	Not normal	Not normal	N/A		
MW1	Compliance Well #1	Normal	Normal	Significant	Significant	Significant
MW2	Compliance Well #2	Not normal	Not normal	Significant	Significant	Significant
MW3	Compliance Well #3	Normal	Normal	Significant	Significant	Significant
MW5	Compliance Well #4	Normal	Normal	Significant	Significant	Significant
	Compliance Well #5					

** Please note that the above cells will appear blank in cases where a test cannot be conducted due to lack of data, or if the test assumptions are invalid due to lack of data variation.

Results: Linear Regression Trend Analysis and Interpretation of Data

		Regression Line Slope	Pearson Correlation (R)	Interpretation	
				Linear Trend	Degree of Data Linearity
MW4	Background Well	-0.05294164	-0.445742771	Slight Decrease	Moderately Weak
MW1	Compliance Well #1	0.013440387	0.179531857	Slight Increase	Very Weak
MW2	Compliance Well #2	0.032691869	0.634535897	Slight Increase	Moderately Strong
MW3	Compliance Well #3	0.112050616	0.41935949	Slight Increase	Moderately Weak
MW5	Compliance Well #4	0.034239022	0.517553608	Slight Increase	Moderately Strong
	Compliance Well #5				

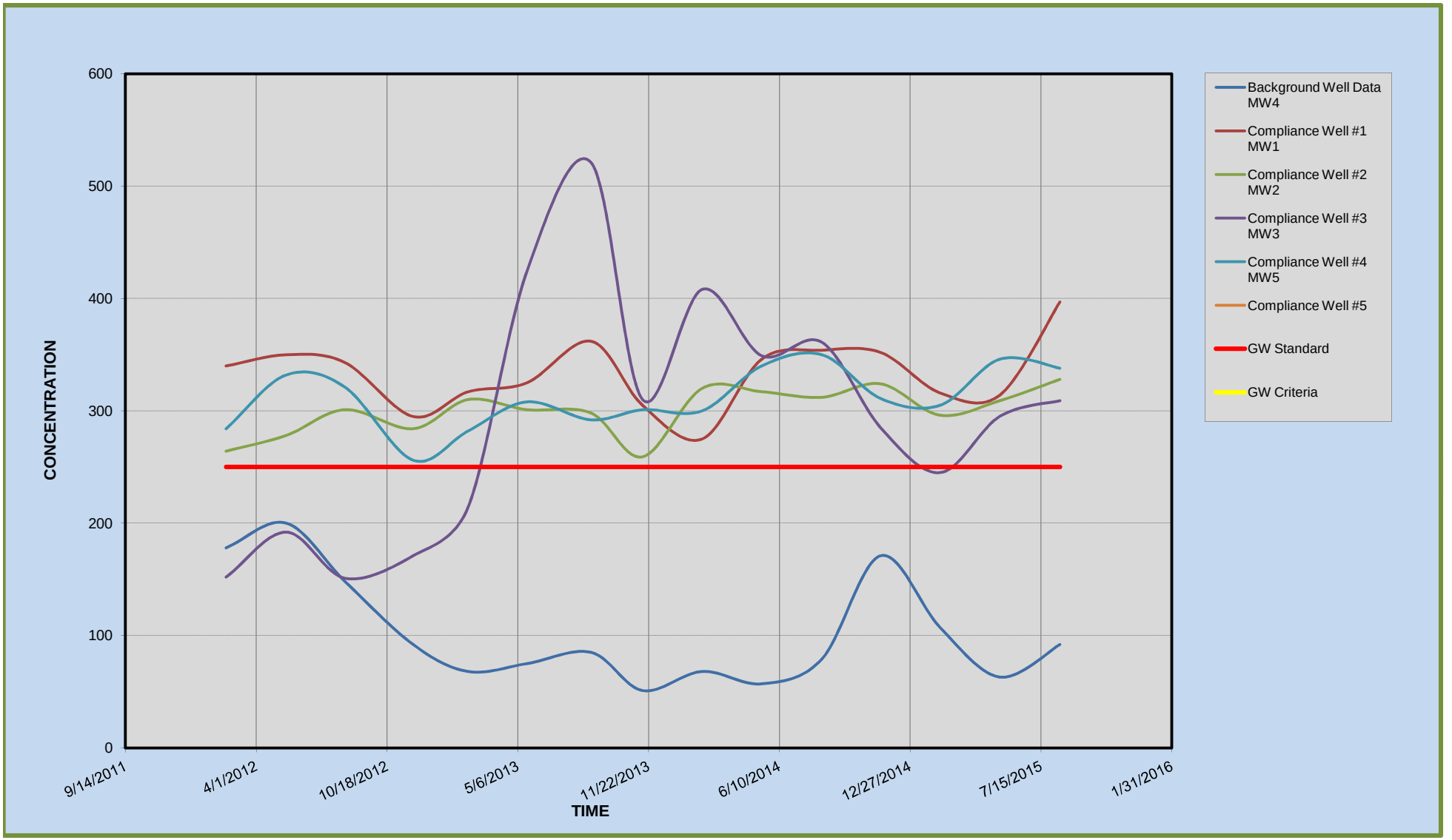
Results: Groundwater Standards/Criteria Comparison

		Groundwater Standard		Groundwater Criteria		Total No. of Data Points
		No. Violations of GW Standard	% Violations of GW Standard	No. Violations of GW Criteria	% Violations of GW Criteria	
MW4	Background Well	0	0%			15
MW1	Compliance Well #1	15	100%			15
MW2	Compliance Well #2	15	100%			15
MW3	Compliance Well #3	9	60%			15
MW5	Compliance Well #4	15	100%			15
	Compliance Well #5					

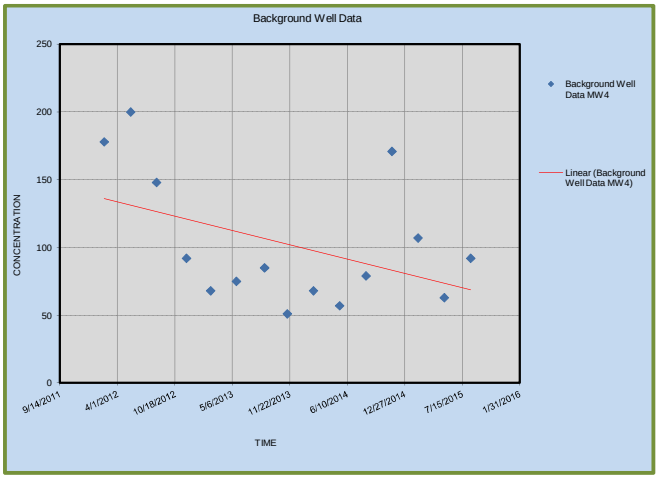
Results: Basic Statistics (less-than values ignored)

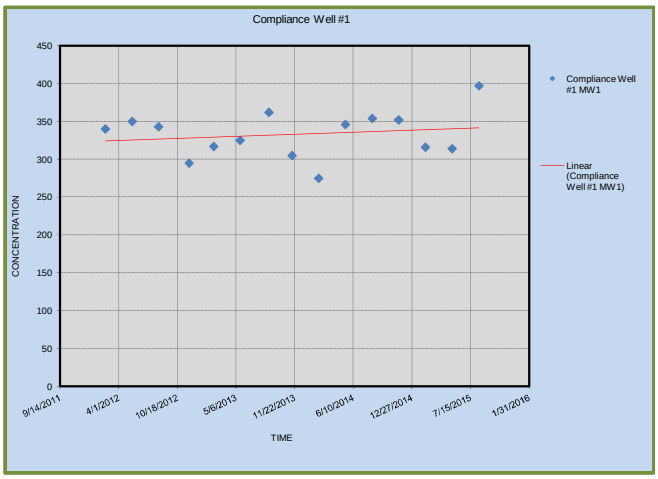
		Maximum Value	Minimum Value	Average		
MW4	Background Well	200.000	51.000	102.267		
MW1	Compliance Well #1	397.000	275.000	332.733		
MW2	Compliance Well #2	328.000	259.000	300.067		
MW3	Compliance Well #3	521.000	151.000	292.467		
MW5	Compliance Well #4	350.000	256.000	311.067		
	Compliance Well #5					

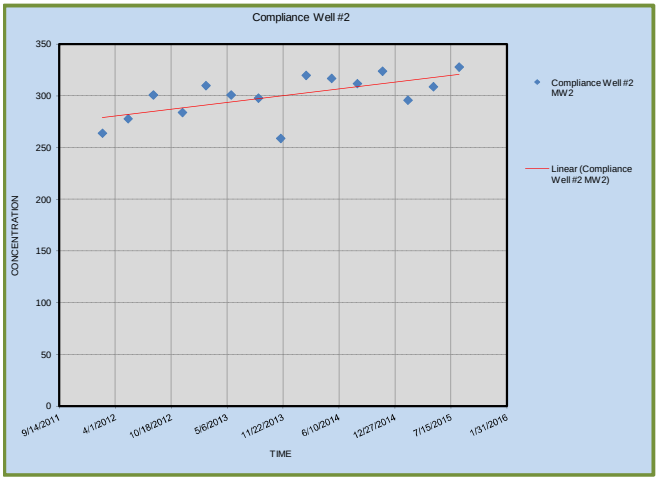
Addison-Evans: Groundwater Monitoring Data for TDS

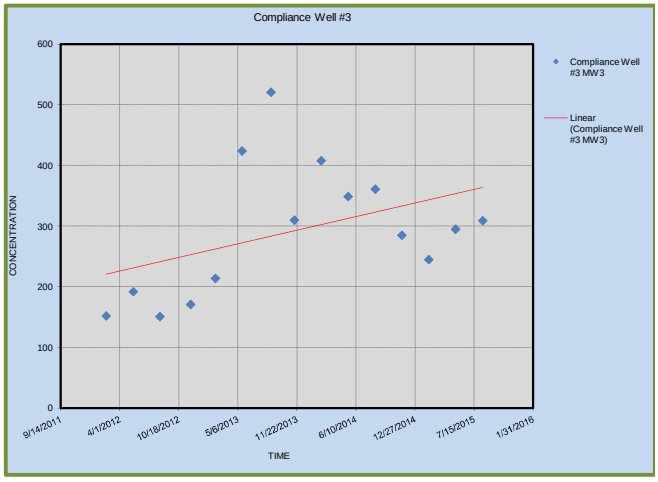


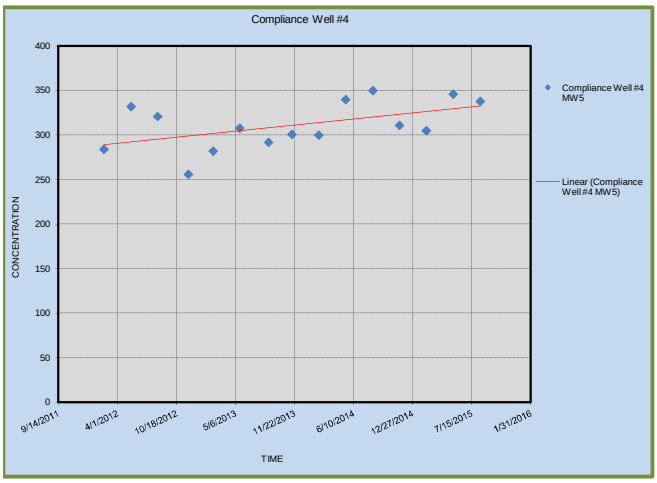
Addison-Evans: Groundwater Monitoring Regression Trends for TDS

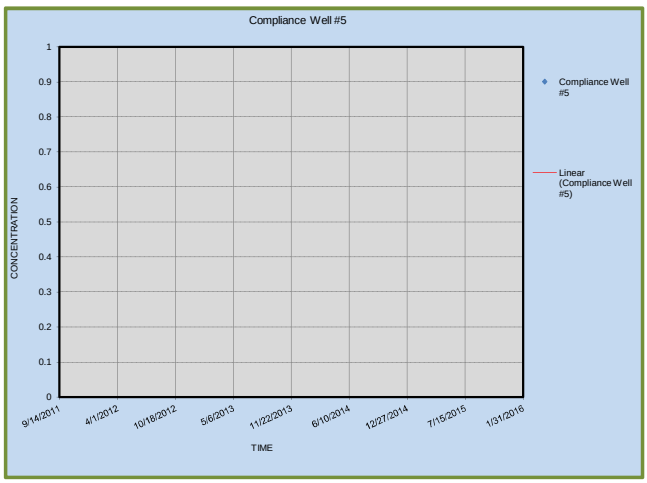












Groundwater Monitoring Data Analysis (v.3)

Facility Name:	Addison-Evans
Permit No.:	VA0006254
Monitoring Parameter:	TOC
Applicable GW Standard (if none leave blank):	10
Applicable GW Criteria (if none leave blank):	
Concentration Units (all data):	mg/L

	Well Designation ►	Data Entry: MW4	MW1	MW2	MW3	MW5	
	Sample or Report Date (ascending)	Background Well Data	Compliance Well #1	Compliance Well #2	Compliance Well #3	Compliance Well #4	Compliance Well #5
1	2/15/2012	1.1	16.3	3.9	1.6	1.7	
2	5/17/2012	1.5	27.2	4.7	1.5	2.8	
3	8/15/2012	3.6	14	5	1.5	2.4	
4	11/27/2012	1.3	19.6	5.6	1.6	2.3	
5	2/19/2013	0	20.2	5.3	1.3	2.2	
6	5/20/2013	1	15.7	4.9	155	1.9	
7	8/26/2013	1.8	15.6	5.6	4.7	2.4	
8	11/13/2013	0	14	4.8	2.5	2.3	
9	2/12/2014	1.6	11	4.7	13.4	1.8	
10	5/14/2014	1.4	14.1	4.9	2.9	2.1	
11	8/14/2014	1.3	16.1	5.3	3.3	3.4	
12	11/12/2014	0	14.6	5.3	3.3	2.2	
13	2/11/2015	1.2	29.5	5	3.2	2.1	
14	5/13/2015	1.4	26.2	6.1	4.5	3.3	
15	8/13/2015	1.3	25.4	6	2.4	2.6	
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Results: Significance to Background **

		Distribution Tests		Non-normal Test	Normal Tests	
		Shapiro-Wilk Normality Test	Shapiro-Wilk Log-Normality Test	Wilcoxon Rank Sum Test	T-test	T-test (lognormal)
MW4	Background Well	Not normal		N/A		
MW1	Compliance Well #1	Not normal	Not normal	Significant	Significant	
MW2	Compliance Well #2	Not normal	Not normal	Significant	Significant	
MW3	Compliance Well #3	Not normal	Not normal	Significant	Not Significant	
MW5	Compliance Well #4	Not normal	Not normal	Significant	Significant	
	Compliance Well #5					

** Please note that the above cells will appear blank in cases where a test cannot be conducted due to lack of data, or if the test assumptions are invalid due to lack of data variation.

Results: Linear Regression Trend Analysis and Interpretation of Data

		Regression Line Slope	Pearson Correlation (R)	Interpretation	
				Linear Trend	Degree of Data Linearity
MW4	Background Well	-0.000470442	-0.216903472	Slight Decrease	Very Weak
MW1	Compliance Well #1	0.003750771	0.263790101	Slight Increase	Moderately Weak
MW2	Compliance Well #2	0.00083495	0.607096793	Slight Increase	Moderately Strong
MW3	Compliance Well #3	-0.009754672	-0.100789152	Slight Decrease	Very Weak
MW5	Compliance Well #4	0.000425847	0.351856252	Slight Increase	Moderately Weak
	Compliance Well #5				

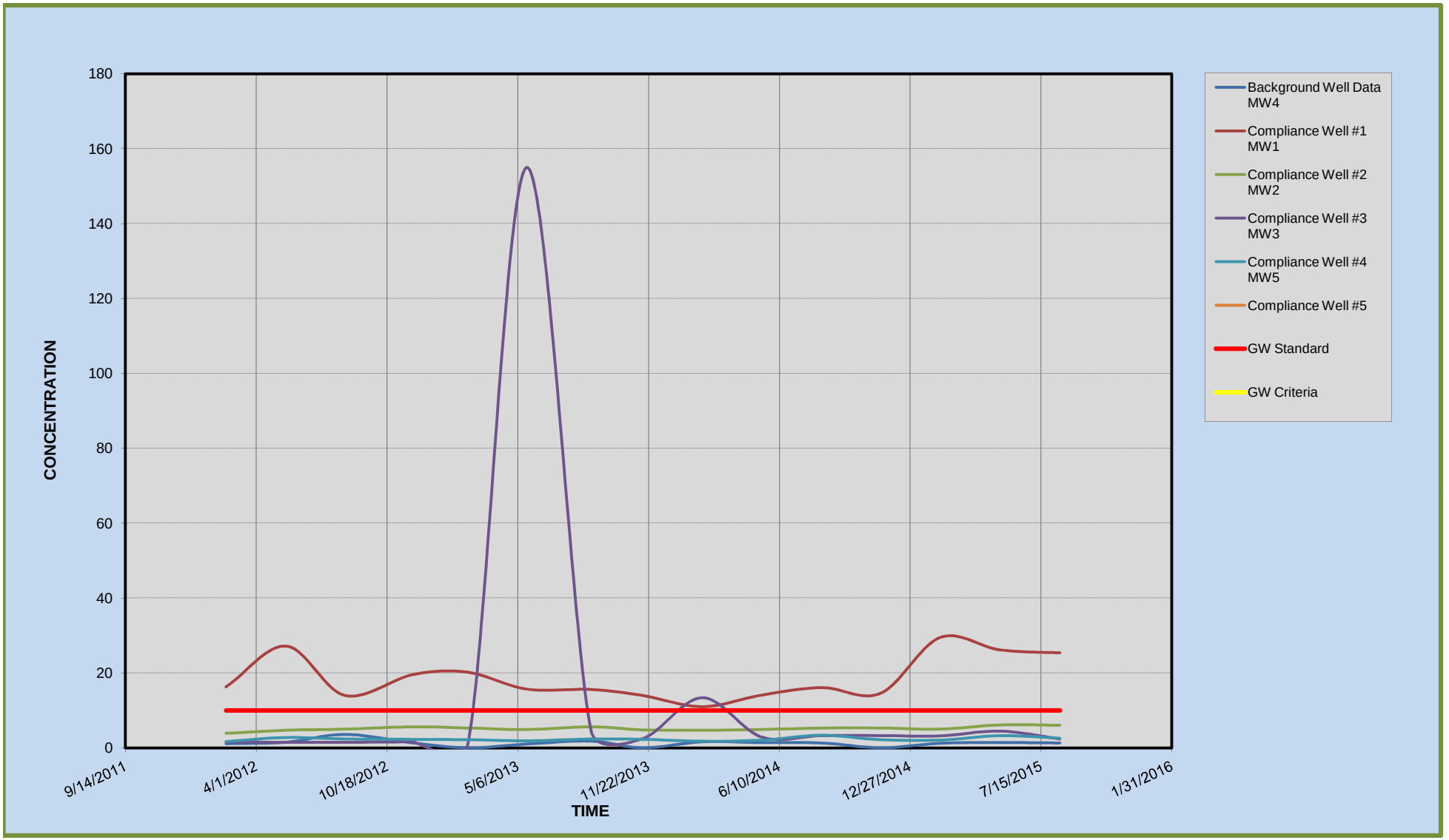
Results: Groundwater Standards/Criteria Comparison

		Groundwater Standard		Groundwater Criteria		Total No. of Data Points
		No. Violations of GW Standard	% Violations of GW Standard	No. Violations of GW Criteria	% Violations of GW Criteria	
MW4	Background Well	0	0%			15
MW1	Compliance Well #1	15	100%			15
MW2	Compliance Well #2	0	0%			15
MW3	Compliance Well #3	2	13.3%			15
MW5	Compliance Well #4	0	0%			15
	Compliance Well #5					

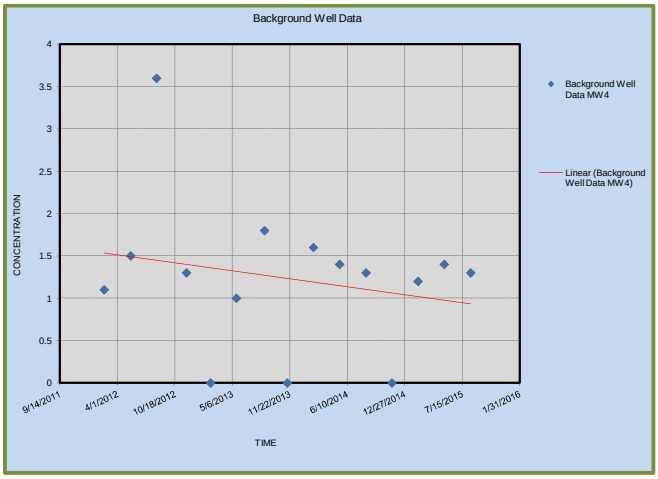
Results: Basic Statistics (less-than values ignored)

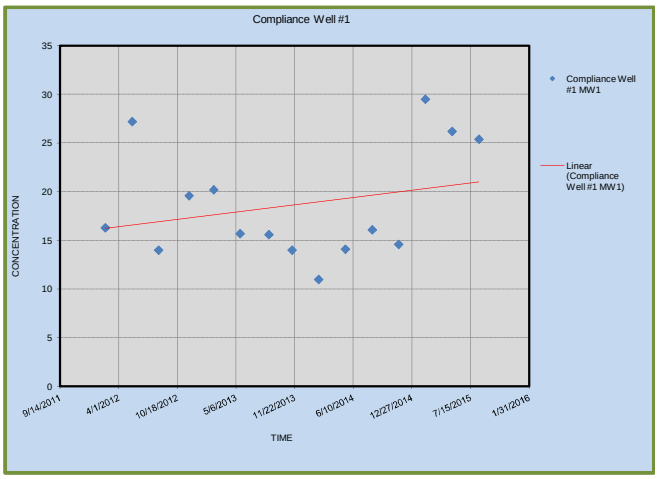
		Maximum Value	Minimum Value	Average		
MW4	Background Well	3.600	0.000	1.233		
MW1	Compliance Well #1	29.500	11.000	18.633		
MW2	Compliance Well #2	6.100	3.900	5.140		
MW3	Compliance Well #3	155.000	1.300	13.513		
MW5	Compliance Well #4	3.400	1.700	2.367		
	Compliance Well #5					

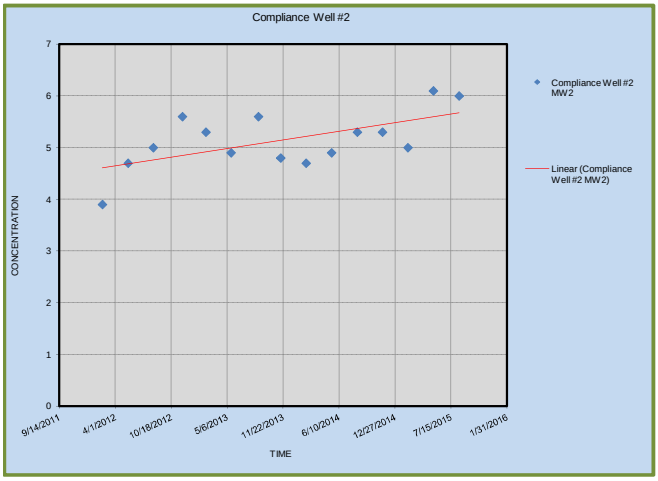
Addison-Evans: Groundwater Monitoring Data for TOC

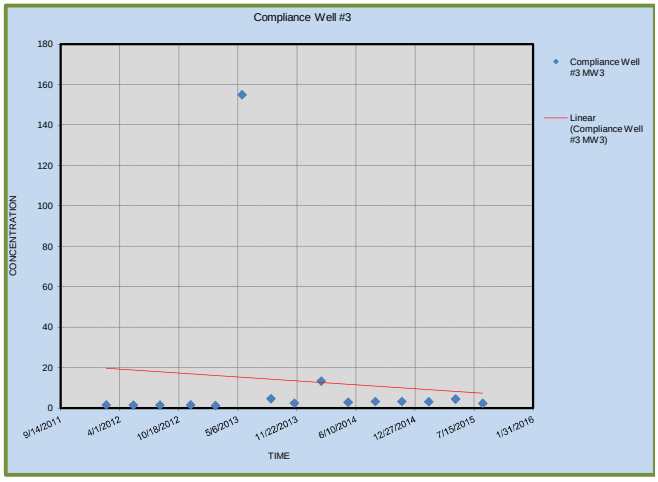


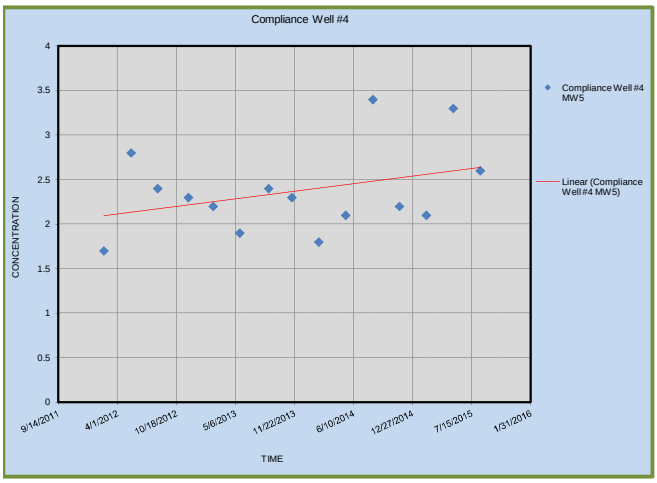
Addison-Evans: Groundwater Monitoring Regression Trends for TOC

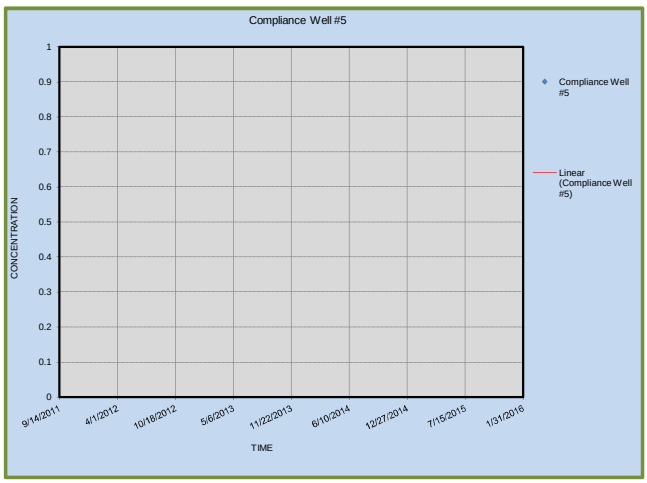












Groundwater Monitoring Data Analysis (v.3)

Facility Name:	Addison-Evans
Permit No.:	VA0006254
Monitoring Parameter:	TSS
Applicable GW Standard (if none leave blank):	
Applicable GW Criteria (if none leave blank):	
Concentration Units (all data):	mg/L

	Well Designation ►	Data Entry					
		MW4	MW1	MW2	MW3	MW5	
	Sample or Report Date (ascending)	Background Well Data	Compliance Well #1	Compliance Well #2	Compliance Well #3	Compliance Well #4	Compliance Well #5
1	2/15/2012	612	18.4	47.8	24.4	104	
2	5/17/2012	200	17.8	0	2	20.2	
3	8/15/2012	78.5	2.6	2.7	1.6	1.9	
4	11/27/2012	7.9	1	0	0	0	
5	2/19/2013	6.7	13.9	2	1.4	0	
6	5/20/2013	1.6	11.9	0	8.5	0	
7	8/26/2013	20	23.3	1.3	4.3	1	
8	11/13/2013	0	2	0	3.1	0	
9	2/12/2014	7.6	7.1	0	0	0	
10	5/14/2014	2	22.7	2	3.4	1.3	
11	8/14/2014	2.4	9.7	0	4.1	0	
12	11/12/2014	15.9	5.9	12.8	7.2	1.2	
13	2/11/2015	13	12.3	1.7	9.1	0	
14	5/13/2015	2.7	9.2	8.4	27.4	2.1	
15	8/13/2015	0	9.3	0	2.5	2.4	
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Results: Significance to Background **

		Distribution Tests		Non-normal Test	Normal Tests	
		Shapiro-Wilk Normality Test	Shapiro-Wilk Log-Normality Test	Wilcoxon Rank Sum Test	T-test	T-test (lognormal)
MW4	Background Well	Not normal		N/A		
MW1	Compliance Well #1	Normal	Normal	Not Significant	Not Significant	
MW2	Compliance Well #2	Not normal		Not Significant	Not Significant	
MW3	Compliance Well #3	Not normal		Not Significant	Not Significant	
MW5	Compliance Well #4	Not normal		Not Significant	Not Significant	
	Compliance Well #5					

** Please note that the above cells will appear blank in cases where a test cannot be conducted due to lack of data, or if the test assumptions are invalid due to lack of data variation.

Results: Linear Regression Trend Analysis and Interpretation of Data

		Regression Line Slope	Pearson Correlation (R)	Interpretation	
				Linear Trend	Degree of Data Linearity
MW4	Background Well	-0.229541096	-0.581415232	Slight Decrease	Moderately Strong
MW1	Compliance Well #1	-0.002133169	-0.122319238	Slight Decrease	Very Weak
MW2	Compliance Well #2	-0.009611767	-0.316331723	Slight Decrease	Moderately Weak
MW3	Compliance Well #3	0.002267841	0.110452488	Slight Increase	Very Weak
MW5	Compliance Well #4	-0.032653032	-0.494459788	Slight Decrease	Moderately Weak
	Compliance Well #5				

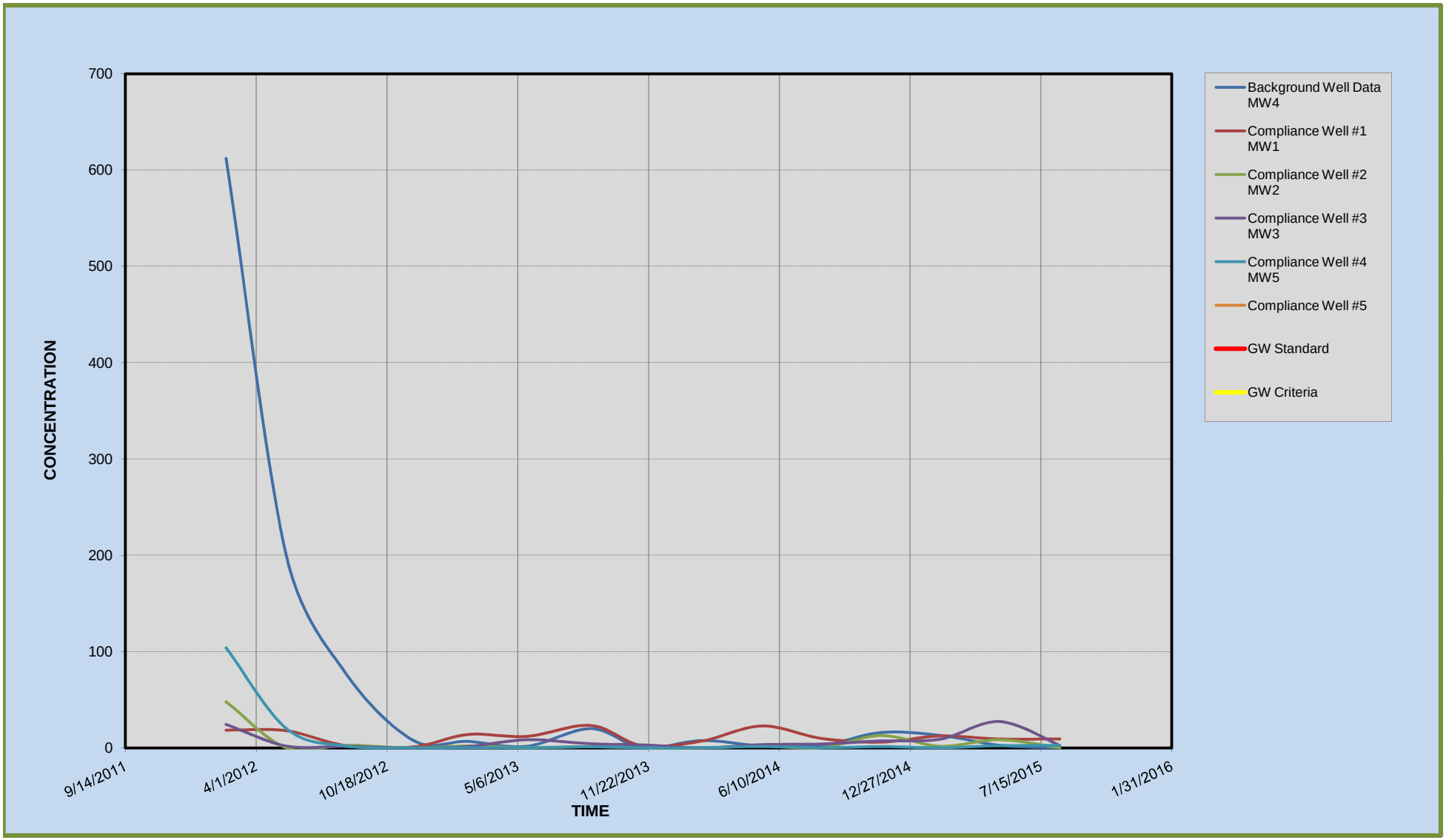
Results: Groundwater Standards/Criteria Comparison

		Groundwater Standard		Groundwater Criteria		Total No. of Data Points
		No. Violations of GW Standard	% Violations of GW Standard	No. Violations of GW Criteria	% Violations of GW Criteria	
MW4	Background Well					15
MW1	Compliance Well #1					15
MW2	Compliance Well #2					15
MW3	Compliance Well #3					15
MW5	Compliance Well #4					15
	Compliance Well #5					

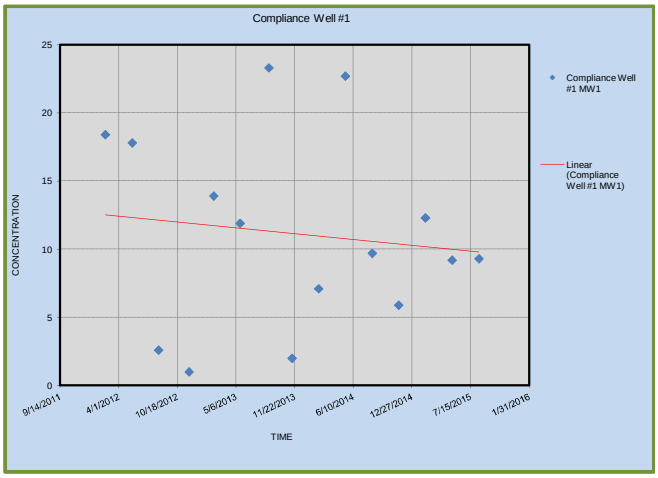
Results: Basic Statistics (less-than values ignored)

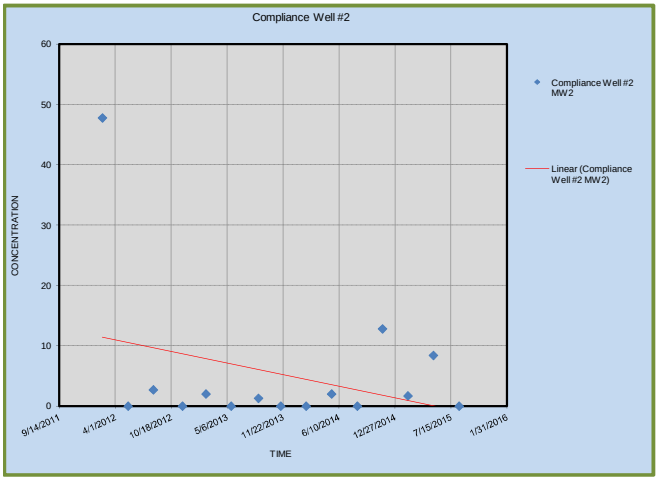
		Maximum Value	Minimum Value	Average		
MW4	Background Well	612.000	0.000	64.687		
MW1	Compliance Well #1	23.300	1.000	11.140		
MW2	Compliance Well #2	47.800	0.000	5.247		
MW3	Compliance Well #3	27.400	0.000	6.600		
MW5	Compliance Well #4	104.000	0.000	8.940		
	Compliance Well #5					

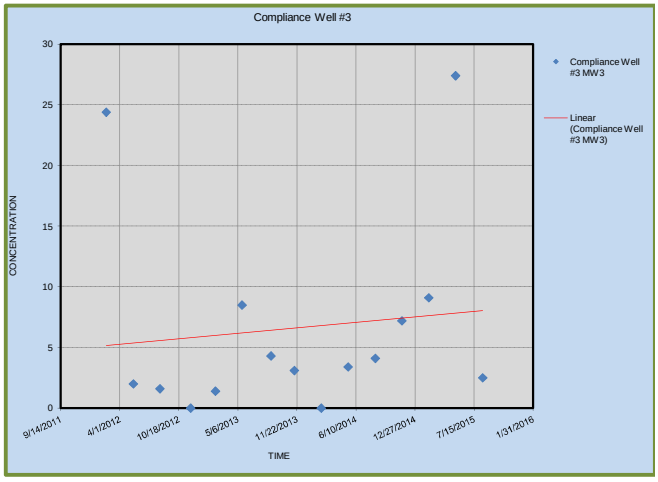
Addison-Evans: Groundwater Monitoring Data for TSS

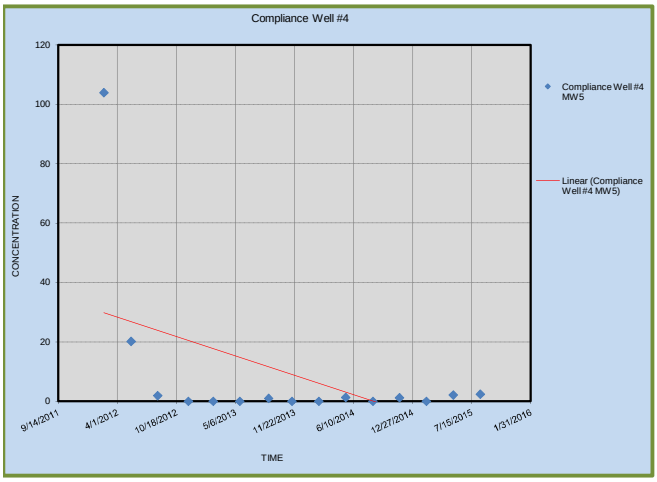


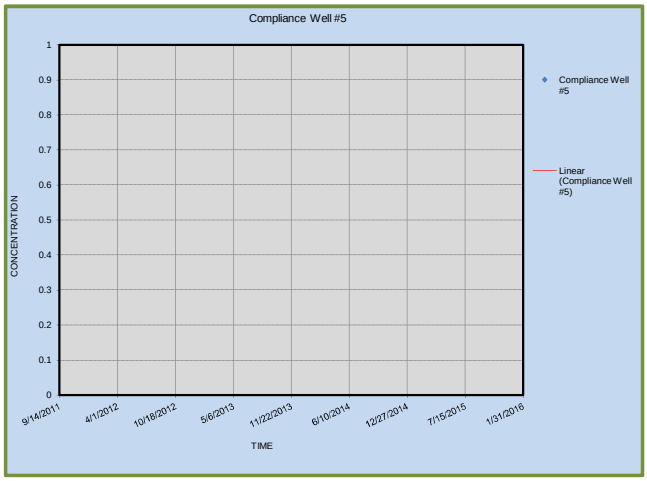
Addison-Evans: Groundwater Monitoring Regression Trends for TSS











Groundwater Data and Analysis Summary for pH

East Field

Facility Name:	Addison-Evans		
Permit Number:	VA0006254	Date:	1/20/2016
Parameter:	pH	Units:	S.U.
Upgradient Well Designation		MW4	
Downgradient Well Designation		MW1	
Downgradient Well Designation		MW2	
Downgradient Well Designation		MW3	
Downgradient Well Designation		MW5	
Applicable Groundwater Standard (Lower):		**5.5**	**S.U.**
Applicable Groundwater Standard (Upper):		**8.5**	**S.U.**

	Significant difference from Upgradient Well using parametric test?	Trend Analysis R-Sq.	Trend Analysis Slope
MW1	YES	0.0117	0.0001
MW2	YES	0.0471	0.0002

	Groundwater Monitoring Report Date	MW4 (Upgradient Well)	MW1	MW2	MW3	MW5	
1	2/15/2012	6.88	6.14	6.56	6.62	6.55	
2	5/17/2012	6.9	6.48	6.63	6.28	6.61	
3	8/15/2012	6.55	6.69	6.68	6.72	6.78	
4	11/27/2012	6.55	6.69	6.68	6.72	6.78	
5	2/19/2013	7.31	7.15	6.95	6.55	7.08	
6	5/20/2013	6.13	6.68	6.73	7.07	6.39	
7	8/26/2013	6.69	6.53	7.12	6.98	6.74	
8	11/13/2013	6.68	8.27	7.68	7.58	7.11	
9	2/12/2014	6.77	6.89	6.66	6.36	6.39	
10	5/14/2014	6.32	6.46	6.6	6.67	6.3	
11	8/14/2014	6.29	6.88	6.76	6.89	6.85	
12	11/12/2014	6.45	6.74	6.81	6.61	6.51	
13	2/11/2015	6.07	6.65	7.05	6.95	6.75	
14	5/13/2015	5.59	6.49	6.88	6.43	6.27	
15	8/13/2015	5.68	6.72	6.74	6.29	6.4	
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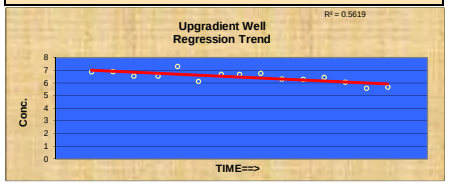
St.Dev. ►	0.46	0.48	0.28	0.34	0.26
Mean ►	6.46	6.76	6.84	6.71	6.63
Is the Mean greater than 3X St.Dev. ? ►	YES	YES	YES	YES	YES

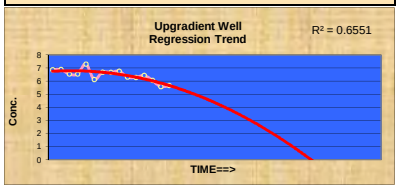
Note: The comparison of the Mean to three times the Standard Deviation may help to determine if there is a statistically significant change in the trend of a data set. If any of the cells above contain "NO", this may be an indication of a sudden increase or decrease in concentration of the parameter. This should only be used as a flag and not the basis for any final decisions regarding the acceptability of the data.

Linear Regressions:

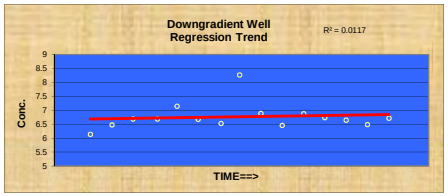
Polynomial Regressions:

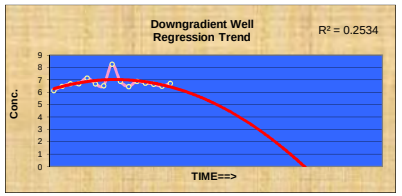
MW4 (Upgradient Well)



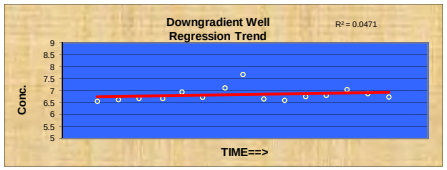


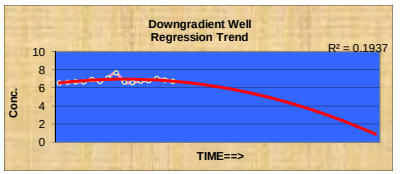
MW1



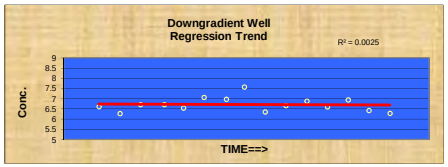


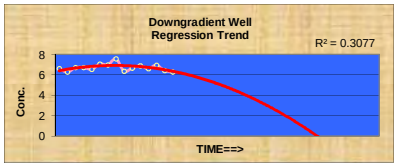
MW2



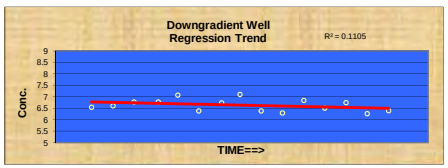


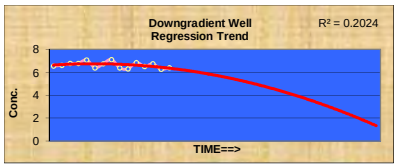
MW3



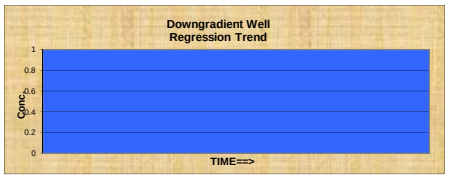


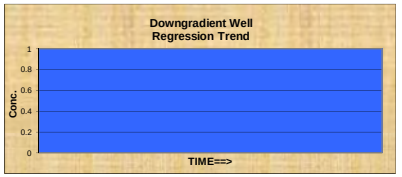
MW5

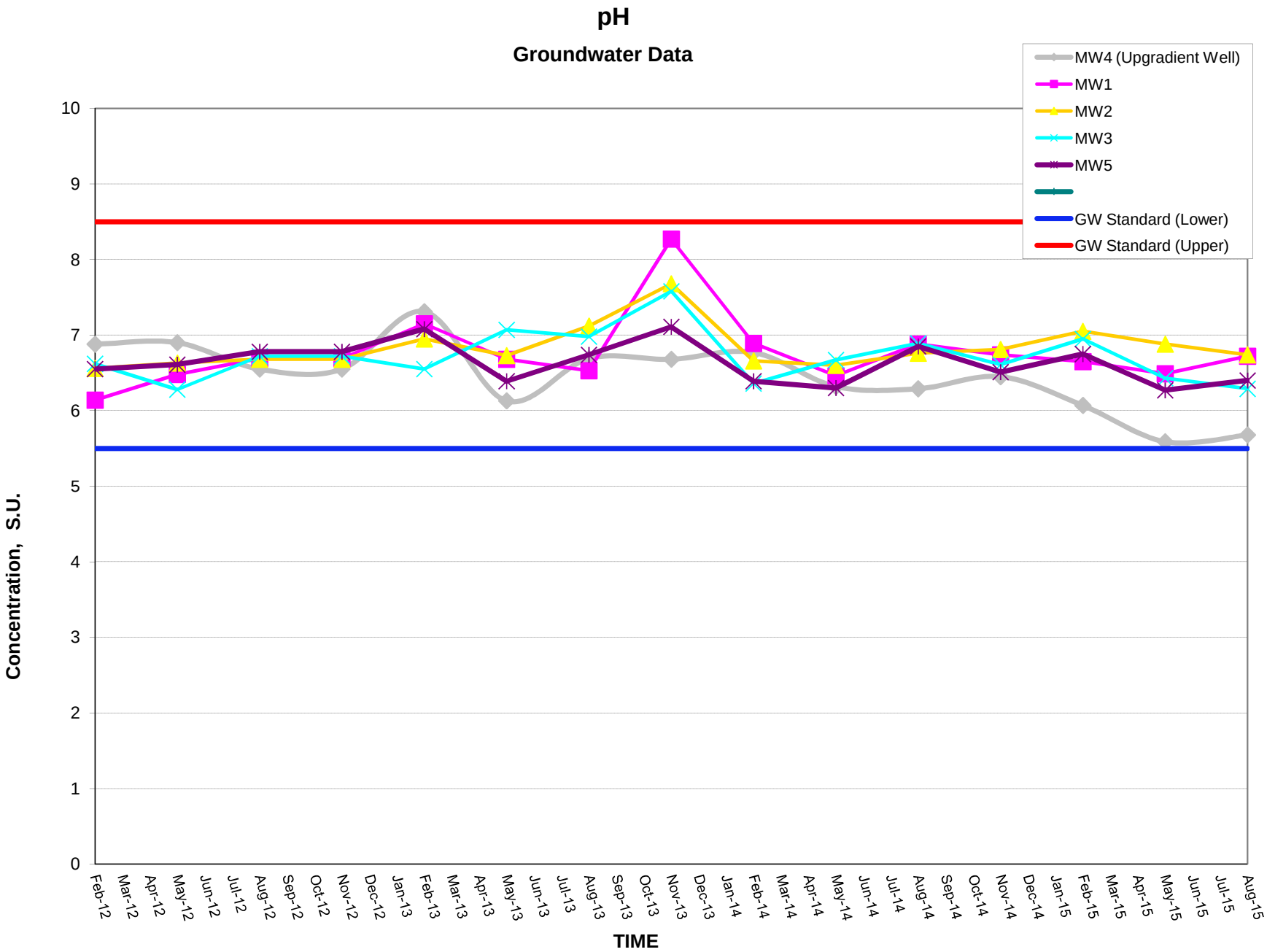




0






pH
Groundwater Data
MW4 (Upgradient Well)
MW1
MW2
MW3
MW5
GW Standard (Lower)
GW Standard (Upper)
Concentration, S.U.
TIME
0
1
2
3
4
5
6
7
8
9
10
Feb-12
Mar-12
Apr-12
May-12
Jun-12
Jul-12
Aug-12
Sep-12
Oct-12
Nov-12
Dec-12
Jan-13
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Oct-14
Nov-14
Dec-14
Jan-15
Feb-15
Mar-15
Apr-15
May-15
Jun-15
Jul-15
Aug-15

	pH		MW1

Non-Normal Test

	Upgradient Data	Downgradient Data
1	6.88	6.14
2	6.9	6.48
3	6.55	6.69
4	6.55	6.69
5	7.31	7.15
6	6.13	6.68
7	6.69	6.53
8	6.68	8.27
9	6.77	6.89
10	6.32	6.46
11	6.29	6.88
12	6.45	6.74
13	6.07	6.65
14	5.59	6.49
15	5.68	6.72
16		
17		
18		
19		
20		
21		
	Minimum 5.59	**Minimum** 6.14
	Maximum 7.31	**Maximum** 8.27

Is there a significant difference?

Lower Range	Upper Range
NO	**YES**

YES-Upper Range

Cochran's Approximation to the Behrens-Fisher Student's t-Test (at a 5% Level of Significance)

	Upgradient Data	Downgradient Data	$[X_b-X_b(ave)]^2$	$[X_m-X_m(ave)]^2$
1	6.88	6.14	0.178647111	0.389376
2	6.9	6.48	0.195953778	0.080656
3	6.55	6.69	0.008587111	0.005476
4	6.55	6.69	0.008587111	0.005476
5	7.31	7.15	0.727040444	0.148996
6	6.13	6.68	0.107147111	0.007056
7	6.69	6.53	0.054133778	0.054756
8	6.68	8.27	0.049580444	2.268036
9	6.77	6.89	0.097760444	0.015876
10	6.32	6.46	0.018860444	0.092416
11	6.29	6.88	0.028000444	0.013456
12	6.45	6.74	5.37778E-05	0.000576
13	6.07	6.65	0.150027111	0.012996
14	5.59	6.49	0.752267111	0.075076
15	5.68	6.72	0.604247111	0.001936
16	0	0	0	0
17	0	0	0	0
18	0	0	0	0
19	0	0	0	0
20	0	0	0	0
21	0	0	0	0

Xb(ave)	6.457333333	Average of background data
Xm(ave)	6.7640000	Average of downgradient data
T_b =	1.761	From Lookup Table
T_m =	1.761	
s_b^2 =	0.212920952	= $[(X_{b1}-X_b(ave))^2+(X_{b2}-X_b(ave))^2...(X_{bn}-X_b(ave))^2]/(n_b-1)$
s_m^2 =	0.226582857	= $[(X_{m1}-X_m(ave))^2+(X_{m2}-X_m(ave))^2..(X_{mn}-X_m(ave))^2]/(n_m-1)$
T_{star} =	1.791558032	= [Xm(ave)-Xb(ave)]/sqrt(sm2/nm + sb2/nb)
W_b =	0.01419473	= sb2/nb
W_m =	0.015105524	= sm2/nm
T_{comp} =	1.761	= (Wb*Tb + Wm*Tm)/(Wb + Wm)

There is a significant increase in this parameter

	pH		MW2

Non-Normal Test

	Upgradient Data	Downgradient Data
1	6.88	6.56
2	6.9	6.63
3	6.55	6.68
4	6.55	6.68
5	7.31	6.95
6	6.13	6.73
7	6.69	7.12
8	6.68	7.68
9	6.77	6.66
10	6.32	6.6
11	6.29	6.76
12	6.45	6.81
13	6.07	7.05
14	5.59	6.88
15	5.68	6.74
16		
17		
18		
19		
20		
	Minimum 5.59	**Minimum** 6.56
	Maximum 7.31	**Maximum** 7.68

Is there a significant difference?

Lower Range	Upper Range
NO	**YES**

YES-Upper Range

Cochran's Approximation to the Behrens-Fisher Student's t-Test (at a 5% Level of Significance)

	Upgradient Data	Downgradient Data	$[X_b-X_b(ave)]^2$	$[X_m-X_m(ave)]^2$
1	6.88	6.56	0.178647111	0.075808444
2	6.9	6.63	0.195953778	0.042161778
3	6.55	6.68	0.008587111	0.024128444
4	6.55	6.68	0.008587111	0.024128444
5	7.31	6.95	0.727040444	0.013148444
6	6.13	6.73	0.107147111	0.011095111
7	6.69	7.12	0.054133778	0.081035111
8	6.68	7.68	0.049580444	0.713461778
9	6.77	6.66	0.097760444	0.030741778
10	6.32	6.6	0.018860444	0.055381778
11	6.29	6.76	0.028000444	0.005675111
12	6.45	6.81	5.37778E-05	0.000641778
13	6.07	7.05	0.150027111	0.046081778
14	5.59	6.88	0.752267111	0.001995111
15	5.68	6.74	0.604247111	0.009088444
16	0	0	0	0
17	0	0	0	0
18	0	0	0	0
19	0	0	0	0
20	0	0	0	0

Xb(ave) =	6.457333333	Average of background data
Xm(ave) =	6.8353333	Average of downgradient data
T_b =	1.761	From Lookup Table
T_m =	1.761	
s_b^2 =	0.212920952	= $[(X_{b1}-X_b(ave))^2+(X_{b2}-X_b(ave))^2...(X_{bn}-X_b(ave))^2]/(n_b-1)$
s_m^2 =	0.081040952	= $[(X_{m1}-X_m(ave))^2+(X_{m2}-X_m(ave))^2..(X_{mn}-X_m(ave))^2]/(n_m-1)$
T_{star} =	2.700174944	= [Xm(ave)-Xb(ave)]/sqrt(sm2/nm + sb2/nb)
W_b =	0.01419473	= sb2/nb
W_m =	0.00540273	= sm2/nm
T_{comp} =	1.761	= (Wb*Tb + Wm*Tm)/(Wb + Wm)

There is a significant increase in this parameter

	pH		MW3

Non-Normal Test

	Upgradient Data	Downgradient Data
1	6.88	6.62
2	6.9	6.28
3	6.55	6.72
4	6.55	6.72
5	7.31	6.55
6	6.13	7.07
7	6.69	6.98
8	6.68	7.58
9	6.77	6.36
10	6.32	6.67
11	6.29	6.89
12	6.45	6.61
13	6.07	6.95
14	5.59	6.43
15	5.68	6.29
16		
17		
18		
19		
20		
21		
Minimum	5.59	6.28
Maximum	7.31	7.58

Is there a significant difference?

Lower Range	Upper Range
NO	YES

YES-Upper Range

Cochran's Approximation to the Behrens-Fisher Student's t-Test (at a 5% Level of Significance)

	Upgradient Data	Downgradient Data	$[X_b-X_b(ave)]^2$	$[X_m-X_m(ave)]^2$
1	6.88	6.62	0.178647111	0.008961778
2	6.9	6.28	0.195953778	0.188935111
3	6.55	6.72	0.008587111	2.84444E-05
4	6.55	6.72	0.008587111	2.84444E-05
5	7.31	6.55	0.727040444	0.027115111
6	6.13	7.07	0.107147111	0.126261778
7	6.69	6.98	0.054133778	0.070401778
8	6.68	7.58	0.049580444	0.748801778
9	6.77	6.36	0.097760444	0.125788444
10	6.32	6.67	0.018860444	0.001995111
11	6.29	6.89	0.028000444	0.030741778
12	6.45	6.61	5.37778E-05	0.010955111
13	6.07	6.95	0.150027111	0.055381778
14	5.59	6.43	0.752267111	0.081035111
15	5.68	6.29	0.604247111	0.180341778
16	0	0	0	0
17	0	0	0	0
18	0	0	0	0
19	0	0	0	0
20	0	0	0	0
21	0	0	0	0

Xb(ave) =	6.457333333	Average of background data
Xm(ave) =	6.7146667	Average of downgradient data
T_b =	1.761	From Lookup Table
T_m =	1.761	
s_b^2 =	0.212920952	= $[(X_{b1}-X_b(ave))^2+(X_{b2}-X_b(ave))^2...(X_{bn}-X_b(ave))^2]/(n_b-1)$
s_m^2 =	0.118340952	= $[(X_{m1}-X_m(ave))^2+(X_{m2}-X_m(ave))^2..(X_{mn}-X_m(ave))^2]/(n_m-1)$
T_{star} =	1.731633296	= [Xm(ave)-Xb(ave)]/sqrt(sm2/nm + sb2/nb)
W_b =	0.01419473	= sb2/nb
W_m =	0.007889397	= sm2/nm
T_{comp} =	1.761	= (Wb*Tb + Wm*Tm)/(Wb + Wm)

There is no significant difference between the monitoring data and the background data

	pH		MW5

Non-Normal Test

	Upgradient Data	Downgradient Data
1	6.88	6.55
2	6.9	6.61
3	6.55	6.78
4	6.55	6.78
5	7.31	7.08
6	6.13	6.39
7	6.69	6.74
8	6.68	7.11
9	6.77	6.39
10	6.32	6.3
11	6.29	6.85
12	6.45	6.51
13	6.07	6.75
14	5.59	6.27
15	5.68	6.4
16		
17		
18		
19		
20		
	Minimum 5.59	**Minimum** 6.27
	Maximum 7.31	**Maximum** 7.11

Is there a significant difference?

Lower Range	Upper Range
NO	**NO**

NO

Cochran's Approximation to the Behrens-Fisher Student's t-Test (at a 5% Level of Significance)

	Upgradient Data	Downgradient Data	$[X_b-X_b(ave)]^2$	$[X_m-X_m(ave)]^2$
1	6.88	6.55	0.178647111	0.007056
2	6.9	6.61	0.195953778	0.000576
3	6.55	6.78	0.008587111	0.021316
4	6.55	6.78	0.008587111	0.021316
5	7.31	7.08	0.727040444	0.198916
6	6.13	6.39	0.107147111	0.059536
7	6.69	6.74	0.054133778	0.011236
8	6.68	7.11	0.049580444	0.226576
9	6.77	6.39	0.097760444	0.059536
10	6.32	6.3	0.018860444	0.111556
11	6.29	6.85	0.028000444	0.046656
12	6.45	6.51	5.37778E-05	0.015376
13	6.07	6.75	0.150027111	0.013456
14	5.59	6.27	0.752267111	0.132496
15	5.68	6.4	0.604247111	0.054756
16	0	0	0	0
17	0	0	0	0
18	0	0	0	0
19	0	0	0	0
20	0	0	0	0

Xb(ave) =	6.457333333	Average of background data
Xm(ave) =	6.6340000	Average of downgradient data
T_b =	1.761	From Lookup Table
T_m =	1.761	
s_b^2 =	0.212920952	= $[(X_{b1}-X_b(ave))^2+(X_{b2}-X_b(ave))^2...(X_{bn}-X_b(ave))^2]/(n_b-1)$
s_m^2 =	0.070025714	= $[(X_{m1}-X_m(ave))^2+(X_{m2}-X_m(ave))^2..(X_{mn}-X_m(ave))^2]/(n_m-1)$
T_{star} =	1.286316834	= [Xm(ave)-Xb(ave)]/sqrt(sm2/nm + sb2/nb)
W_b =	0.01419473	= sb2/nb
W_m =	0.004668381	= sm2/nm
T_{comp} =	1.761	= (Wb*Tb + Wm*Tm)/(Wb + Wm)

There is no significant difference between the monitoring data and the background data

	pH		MP-12

Non-Normal Test

	Upgradient Data	Downgradient Data
1	6.88	
2	6.9	
3	6.55	
4	6.55	
5	7.31	
6	6.13	
7	6.69	
8	6.68	
9	6.77	
10	6.32	
11	6.29	
12	6.45	
13	6.07	
14	5.59	
15	5.68	
16		
17		
18		
19		
20		
21		
22		
23		
24		
	Minimum	**Minimum**
	5.59	0
	Maximum	**Maximum**
	7.31	0

Is there a significant difference?

Lower Range	Upper Range
YES	**NO**

YES-Lower Range

Cochran's Approximation to the Behrens-Fisher Student's t-Test (at a 5% Level of Significance)

	Upgradient Data	Downgradient Data	$[X_b-X_b(ave)]^2$	$[X_m-X_m(ave)]^2$
1	6.88	0	0.178647111	0
2	6.9	0	0.195953778	0
3	6.55	0	0.008587111	0
4	6.55	0	0.008587111	0
5	7.31	0	0.727040444	0
6	6.13	0	0.107147111	0
7	6.69	0	0.054133778	0
8	6.68	0	0.049580444	0
9	6.77	0	0.097760444	0
10	6.32	0	0.018860444	0
11	6.29	0	0.028000444	0
12	6.45	0	5.37778E-05	0
13	6.07	0	0.150027111	0
14	5.59	0	0.752267111	0
15	5.68	0	0.604247111	0
16	0	0	0	0
17	0	0	0	0
18	0	0	0	0
19	0	0	0	0
20	0	0	0	0
21	0	0	0	0
22	0	0	0	0
23	0	0	0	0
24	0	0	0	0

Xb(ave) =	6.457333333	Average of background data
Xm(ave) =	#DIV/0!	Average of downgradient data
T_b =	1.761	From Lookup Table
T_m =	#N/A	
s_b^2 =	0.212920952	= $[(X_{b1}-X_b(ave))^2+(X_{b2}-X_b(ave))^2...(X_{bn}-X_b(ave))^2]/(n_b-1)$
s_m^2 =	0	= $[(X_{m1}-X_m(ave))^2+(X_{m2}-X_m(ave))^2..(X_{mn}-X_m(ave))^2]/(n_m-1)$
T_{star} =	#DIV/0!	= [Xm(ave)-Xb(ave)]/sqrt(sm2/nm + sb2/nb)
W_b =	0.01419473	= sb2/nb
W_m =	#DIV/0!	= sm2/nm
T_{comp} =	#DIV/0!	= (Wb*Tb + Wm*Tm)/(Wb + Wm)

#DIV/0!

ATTACHMENT I

WET Testing Review Memo, WETLIM10

Wrenn, Brian (DEQ)

From: DeBiasi, Deborah (DEQ)
Sent: Tuesday, January 19, 2016 4:52 PM
To: Wrenn, Brian (DEQ)
Subject: RE: Va0006254 Addison-Evans Water Production and Laboratory

Thanks! The WET language is fine.

As an alternative for when you have facilities like this that only discharge on a rare frequency, you can even word it to have them test when they have a discharge, until they have at least 4 sets of tests, with a minimum of 30 days between test events. It may make it more difficult for the compliance auditor to track, but might be your best choice in some cases.

As a side note, page 2 of the fact sheet, item 9:

a discharge into Swift Creek ~~were~~ was

Good job!

Deborah DeBiasi
804-698-4028
Deborah.DeBiasi@deq.virginia.gov

From: Wrenn, Brian (DEQ)
Sent: Tuesday, January 19, 2016 4:31 PM
To: DeBiasi, Deborah (DEQ)
Subject: RE: Va0006254 Addison-Evans Water Production and Laboratory

Sorry Deborah! I've put the draft permit and fact sheet on the T: as well.

Thanks,
Brian Wrenn
804-527-5015

From: DeBiasi, Deborah (DEQ)
Sent: Tuesday, January 19, 2016 4:27 PM
To: Wrenn, Brian (DEQ)
Subject: RE: Va0006254 Addison-Evans Water Production and Laboratory

Is there a fact sheet or something to tell me what this place is, how much of a discharge, etc.?

Deborah DeBiasi
804-698-4028
Deborah.DeBiasi@deq.virginia.gov

From: Wrenn, Brian (DEQ)
Sent: Tuesday, January 19, 2016 4:16 PM
To: DeBiasi, Deborah (DEQ)
Subject: Va0006254 Addison-Evans Water Production and Laboratory

Deborah,

Please find on the T: WET memo for the subject facility. Please let me know if you have any comments or questions. Thanks.

Brian L. Wrenn
VPDES Technical Reviewer
VA DEQ - Piedmont Regional Office
804-527-5015 (Ph.)
804-527-5106 (FAX)
brian.wrenn@deq.virginia.gov
www.deq.virginia.gov

MEMORANDUM

DEPARTMENT OF ENVIRONMENTAL QUALITY
Piedmont Regional Office

4949-A Cox Road, Glen Allen, Virginia 23060-6295 **804/527-5020**

TO: **Deborah DeBiasi, CO**
FROM: **Brian Wrenn**
DATE: **January 20, 2016**
SUBJECT: **VPDES No. VA0006254 – Addison-Evans Water Production and Laboratory; Whole Effluent Toxicity Monitoring**

The subject facility is connected to the Chesterfield County collection system and has never discharged to surface waters. The VPDES permit is maintained for emergency circumstances. Because the facility has never discharged to surface waters, WET testing has never been conducted. It is anticipated that any potential discharges will be temporary and short in duration; therefore, chronic testing was not required. The following condition is included in the draft permit should circumstances arise that necessitate the facility to discharge:

C. WHOLE EFFLUENT TOXICITY (WET) PROGRAM

1. Commencing with the effective date of this permit, the permittee shall perform quarterly toxicity testing on Outfall 001 using 24-hour flow-proportioned composite samples. If a discharge does not occur during a given monitoring quarter, the permittee shall provide written notification to the DEQ Piedmont Regional Office by the 10th of the month following the monitoring quarter that a discharge did not occur. Toxicity testing shall be performed during the next immediate quarter until 4 sets of tests have been completed. The acute tests to use are:

   48 Hour Static Acute Test with *Ceriodaphnia dubia*

   48 Hour Static Acute Test with *Pimephales promelas*

   These acute tests shall be conducted using 5 geometric dilutions of effluent with a minimum of 4 replicates, with 5 organisms in each. The NOAEC (No Observed Adverse Effect Concentration), as determined by hypothesis testing, shall be reported on the DMR. The LC50 should also be determined and noted on the submitted report. Tests in which control survival is less than 90% are not acceptable.

2. The test dilutions should be able to determine compliance with the following endpoint(s):

   NOAEC = 100%

3. The test data will be evaluated statistically by DEQ for reasonable potential at the conclusion of the test period. The data may be evaluated sooner if requested by the permittee, or if toxicity has been noted. Should DEQ evaluation of the data indicate that a limit is needed, the permit may be modified or, alternatively, revoked and reissued to include a WET limit and compliance schedule for that outfall. Following written notification from DEQ of the need for including a WET limitation, the toxicity tests of Part I.C.1 may be discontinued. Test procedures and reporting shall be in accordance with the WET testing methods cited in 40 CFR 136.3.

   If DEQ evaluation of the data shows that no limit is needed, the permittee may discontinue toxicity testing for the duration of the permit following written notification from DEQ.

4. The permit may be modified or revoked and reissued to include pollutant specific limits in lieu of a WET limit should it be demonstrated that toxicity is due to specific parameters. The pollutant specific limits must control the toxicity of the effluent.

5. The permittee shall report the results on the DMR and submit a copy of each toxicity test report in accordance with the following schedule:

   Reporting Schedule:

Period	Period Dates	Compliance Date
Quarter 1	July 1- September 30	October 10
Quarter 2	October 1- December 31	January 10
Quarter 3	January 1- March 31	April 10
Quarter 4	April 1- June 30	July 10

Virginia DEQ
Deborah L. DeBiasi
804-698-4028 dldebiasi@deq.virginia.gov

Spreadsheet for determination of WET test endpoints or WET limits

Excel 97
Revision Date: 01/10/05
File: WETLIM10.xls
(MIX.EXE required also)

Acute Endpoint/Permit Limit — **Use as LC_{50} in Special Condition, as TUa on DMR**

ACUTE	100% =	NOAEC	LC_{50} =	NA	% Use as	NA	TUa

ACUTE WLAa 0.3

Note: Inform the permittee that if the mean of the data exceeds this TUa: 1.0 a limit may result using WLA.EXE

Chronic Endpoint/Permit Limit — **Use as NOEC in Special Condition, as TUc on DMR**

CHRONIC	1.462574684	TU_c	NOEC =	69	% Use as	1.44	TU_c
BOTH*	3.000000074	TU_c	NOEC =	34	% Use as	2.94	TU_c
AML	1.462574684	TU_c	NOEC =	69	% Use as	1.44	TU_c

ACUTE WLAa,c 3
CHRONIC WLAc 1
* Both means acute expressed as chronic

Note: Inform the permittee that if the mean of the data exceeds this TUc: 1.0 a limit may result using WLA.EXE

Enter data in the cells with blue type:

Entry Date: 01/19/16
Facility Name: Addison-Evans WTP
VPDES Number: VA0006254
Outfall Number: 001

	% Flow to be used from MIX.EXE	**Difuser /modeling study?**	
Plant Flow:	0.5 MGD	Enter Y/N	N
Acute 1Q10:	0 MGD 100 %	Acute	1 :1
Chronic 7Q10:	0 MGD 100 %	Chronic	1 :1

Are data available to calculate CV? (Y/N) N (Minimum of 10 data points, same species, needed) Go to Page 2
Are data available to calculate ACR? (Y/N) N (NOEC<LC50, do not use greater/less than data) Go to Page 3

IWC_a	100 %	Plant flow/plant flow + 1Q10	
IWC_c	100 %	Plant flow/plant flow + 7Q10	
Dilution, acute	1	100/IWCa	
Dilution, chronic	1	100/IWCc	
WLA_a	0.3	Instream criterion (0.3 TUa) X's Dilution, acute	
WLA_c	1	Instream criterion (1.0 TUc) X's Dilution, chronic	
$WLA_{a,c}$	3	ACR X's WLA_a - converts acute WLA to chronic units	

NOTE: If the IWCa is >33%, specify the NOAEC = 100% test/endpoint for use

ACR -acute/chronic ratio		10	LC50/NOEC (Default is 10 - if data are available, use tables Page 3)					
CV-Coefficient of variation		0.6	Default of 0.6 - if data are available, use tables Page 2)					
Constants	eA	0.4109447	Default = 0.41					
	eB	0.6010373	Default = 0.60					
	eC	2.4334175	Default = 2.43					
	eD	2.4334175	Default = 2.43 (1 samp)	No. of samples	1			

**The Maximum Daily Limit is calculated from the lowest LTA, X's eC. The LTAa,c and MDL using it are driven by the ACR.

$LTA_{a,c}$	1.2328341	WLAa,c X's eA						
LTA_c	0.6010373	WLAc X's eB				Rounded NOEC's		%
MDL** with $LTA_{a,c}$	3.000000074	TU_c	NOEC =	33.333333	(Protects from acute/chronic toxicity)	NOEC =	34	%
MDL** with LTA_c	1.462574684	TU_c	NOEC =	68.372577	(Protects from chronic toxicity)	NOEC =	69	%
AML with lowest LTA	1.462574684	TU_c	NOEC =	68.372577	Lowest LTA X's eD	NOEC =	69	

IF ONLY ACUTE ENDPOINT/LIMIT IS NEEDED, CONVERT MDL FROM TU_c to TU_a

						Rounded LC50's		%
MDL with $LTA_{a,c}$	0.300000007	TU_a	LC50 =	333.333325	% Use NOAEC=100%	LC50 =	NA	%
MDL with LTA_c	0.146257468	TU_a	LC50 =	683.725769	% Use NOAEC=100%	LC50 =	NA	

Virginia DEQ
Deborah L. DeBiasi
804-698-4028 dldebiasi@deq.virginia.gov

Page 2 - Follow the directions to develop a site specific CV (coefficient of variation)

IF YOU HAVE AT LEAST 10 DATA POINTS THAT ARE QUANTIFIABLE (NOT "<" OR ">") FOR A SPECIES, ENTER THE DATA IN EITHER COLUMN "G" (VERTEBRATE) OR COLUMN "J" (INVERTEBRATE). THE 'CV' WILL BE PICKED UP FOR THE CALCULATIONS BELOW. THE DEFAULT VALUES FOR eA, eB, AND eC WILL CHANGE IF THE 'CV' IS ANYTHING OTHER THAN 0.6.

Coefficient of Variation for effluent tests

CV = 0.6 (Default 0.6)

δ^2 = 0.3074847

δ = 0.554513029

Using the log variance to develop eA
(P. 100, step 2a of TSD)
Z = 1.881 (97% probability stat from table
A = -0.889296658
eA = 0.410944686

Using the log variance to develop eB
(P. 100, step 2b of TSD)
δ_4^2 = 0.086177696
δ_4 = 0.293560379
B = -0.509098225
eB = 0.601037335

Using the log variance to develop eC
(P. 100, step 4a of TSD)

δ^2 = 0.3074847
δ = 0.554513029
C = 0.889296658
eC = 2.433417525

Using the log variance to develop eD
(P. 100, step 4b of TSD)
n = 1 This number will most likely stay as "1", for 1 sample/month.
δ_n^2 = 0.3074847
δ_n = 0.554513029
D = 0.889296658
eD = 2.433417525

	Vertebrate IC_{25} Data or LC_{50} Data	LN of data	Invertebrate IC_{25} Data or LC_{50} Data	LN of data
	**********		**********	
1			1	0
2			2	
3			3	
4			4	
5			5	
6			6	
7			7	
8			8	
9			9	
10			10	
11			11	
12			12	
13			13	
14			14	
15			15	
16			16	
17			17	
18			18	
19			19	
20			20	
St Dev	NEED DATA	NEED DATA	St Dev	NEED DATA NEED DATA
Mean	0	0	Mean	0 0
Variance	0	0.000000	Variance	0 0.000000
CV	0		CV	0

Virginia DEQ
Deborah L. DeBiasi
804-698-4028 dldebiasi@deq.virginia.gov

Page 3 - Follow directions to develop a site specific ACR (Acute to Chronic Ratio)

To determine Acute/Chronic Ratio (ACR), insert usable data below. Usable data is defined as valid paired test results, acute and chronic, tested at the same temperature, same species. The chronic NOEC must be less than the acute LC_{50}, since the ACR divides the LC_{50} by the NOEC. LC_{50}'s >100% should not be used.

Table 1. ACR using Vertebrate data

Set #	LC_{50}	NOEC	Test ACR	Logarithm	Geomean	Antilog	ACR to Use
1	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
2	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
3	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
4	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
5	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
6	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
7	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
8	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
9	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
10	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
				ACR for vertebrate data:			0

Table 1. Result:	Vertebrate ACR	0
Table 2. Result:	Invertebrate ACR	0
	Lowest ACR	Default to 10

Table 2. ACR using Invertebrate data

Set #	LC_{50}	NOEC	Test ACR	Logarithm	Geomean	Antilog	ACR to Use
1	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
2	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
3	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
4	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
5	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
6	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
7	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
8	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
9	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
10	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
				ACR for vertebrate data:			0

Convert LC_{50}'s and NOEC's to Chronic TU's for use in WLA.EXE

Table 3. ACR used: 10

	Enter LC_{50}	TUc	Enter NOEC	TUc
1		NO DATA		NO DATA
2		NO DATA		NO DATA
3		NO DATA		NO DATA
4		NO DATA		NO DATA
5		NO DATA		NO DATA
6		NO DATA		NO DATA
7		NO DATA		NO DATA
8		NO DATA		NO DATA
9		NO DATA		NO DATA
10		NO DATA		NO DATA
11		NO DATA		NO DATA
12		NO DATA		NO DATA
13		NO DATA		NO DATA
14		NO DATA		NO DATA
15		NO DATA		NO DATA
16		NO DATA		NO DATA
17		NO DATA		NO DATA
18		NO DATA		NO DATA
19		NO DATA		NO DATA
20		NO DATA		NO DATA

If WLA.EXE determines that an acute limit is needed, you need to convert the TUc answer you get to TUa and then an LC50,

enter it here:	NO DATA	$\%LC_{50}$
	NO DATA	TUa

DILUTION SERIES TO RECOMMEND

Table 4.

	Monitoring % Effluent	Monitoring TUc	Limit % Effluent	Limit TUc
Dilution series based on data mean	100	1.0		
Dilution series to use for limit			69	1.4492754
Dilution factor to recommend:	0.5		0.8306624	
Dilution series to recommend:	100.0	1.00	100.0	1.00
	50.0	2.00	83.1	1.20
	25.0	4.00	69.0	1.45
	12.5	8.00	57.3	1.74
	6.25	16.00	47.6	2.10
Extra dilutions if needed	3.12	32.05	39.5	2.53
	1.56	64.10	32.9	3.04

Virginia DEQ
Deborah L. DeBiasi
804-698-4028 dldebiasi@deq.virginia.gov

Cell: I9
Comment:
This is assuming that the data are Type 2 data (none of the data in the data set are censored - "<" or ">").

Cell: K18
Comment: This is assuming that the data are Type 2 data (none of the data in the data set are censored - "<" or ">").

Cell: J22
Comment: Remember to change the "N" to "Y" if you have ratios entered, otherwise, they won't be used in the calculations.

Cell: C40
Comment:
If you have entered data to calculate an ACR on page 3, and this is still defaulted to "10", make sure you have selected "Y" in cell E21

Cell: C41
Comment: If you have entered data to calculate an effluent specific CV on page 2, and this is still defaulted to "0.6", make sure you have selected "Y" in cell E20

Cell: L48
Comment:
See Row 151 for the appropriate dilution series to use for these NOEC's

Cell: G62
Comment:
Vertebrates are:
Pimephales promelas
Oncorhynchus mykiss
Cyprinodon variegatus

Cell: J62
Comment:
Invertebrates are:
Ceriodaphnia dubia
Mysidopsis bahia

Cell: C117
Comment: Vertebrates are:

Pimephales promelas
Cyprinodon variegatus

Cell: M119
Comment: The ACR has been picked up from cell C34 on Page 1. If you have paired data to calculate an ACR, enter it in the tables to the left, and make sure you have a "Y" in cell E21 on Page 1. Otherwise, the default of 10 will be used to convert your acute data.

Cell: M121
Comment: If you are only concerned with acute data, you can enter it in the NOEC column for conversion and the number calculated will be equivalent to the TUa. The calculation is the same: 100/NOEC = TUc or 100/LC50 = TUa.

Cell: C138
Comment: Invertebrates are:

Ceriodaphnia dubia
Mysidopsis bahia

ATTACHMENT J

NPDES Permit Rating Sheet

NPDES PERMIT RATING WORK SHEET

☐ Regular Addition
☐ DiscretionaryAddition
☐ Score change, but no status change
☐ Deletion

NPDES NO. __VA0006254_____

Facility Name: _Addison-Evans Water Production and Laboratory _____

City: _Midlothian_____

Receiving Water: _Swift Creek_____

Reach Number: __NA_____

Is this facility a steam electric power plant (SIC=4911) with one or more of the following characteristics?
1. Power output 500 MW or greater (not using a cooling pond/lake)
2. A nuclear power plant
3. Cooling water discharge greater than 25% of the receiving stream's 7Q10 flow rate
☐ YES; score is 600 (stop here) ■NO (continue)

Is this permit for a municipal separate storm sewer serving a population greater than 100,000?

☐ YES; score is 700 (stop here)
■ NO (continue)

FACTOR 1: Toxic Pollutant Potential

PCS SIC Code: _____ Primary SIC Code: _4941_____ Other SIC Codes:
Industrial Subcategory Code: _____ (Code 000 if no subcategory)

Determine the Toxicity potential from Appendix A. Be sure to use the TOTAL toxicity potential column and check one)

Toxicity Group	Code	Points	Toxicity Group	Code	Points	Toxicity Group	Code	Points
☐ No process waste streams	0	0	☐ 3.	3	15	X 7.	7	35
☐ 1.	1	5	☐ 4.	4	20	☐ 8.	8	40
☐ 2.	2	10	☐ 5.	5	25	☐ 9.	9	45
			☐ 6.	6	30	☐ 10.	10	50

Code Number Checked: __7___

Total Points Factor 1: _35____

FACTOR 2: Flow/Stream Flow Volume (*Complete either Section A or Section B; check only one)*

Section A X Wastewater Flow Only Considered

Wastewater Type (See Instructions)		Code	Points
Type I: Flow < 5 MGD	☐	11	0
Flow 5 to 10 MGD	☐	12	10
Flow > 10 to 50 MGD	☐	13	20
Flow > 50 MGD	☐	14	30
Type II: Flow < 1 MGD	X	21	10
Flow 1 to 5 MGD	☐	22	20
Flow > 5 to 10 MGD	☐	23	30
Flow > 10 MGD	☐	24	50
Type III: Flow < 1 MGD	☐	31	0
Flow 1 to 5 MGD	☐	32	10
Flow > 5 to 10 MGD	☐	33	20
Flow > 10 MGD	☐	34	30

Section B ☐ Wastewater and Stream Flow Considered

Wastewater Type (See Instructions)	Percent of instream Wastewater Concentration at Receiving Stream Low Flow		Code	Points
Type I/III:	< 10 %	☐	41	0
	10 % to < 50 %	☐	42	10
	> 50 %	☐	43	20
Type II:	< 10 %	☐	51	0
	10 % to <50 %	☐	52	20
	> 50 %	☐	53	30

Code Checked from Section A or B: __21___
Total Points Factor 2: __10___

FACTOR 3: Conventional Pollutants NPDES NO: VA0006254

(only when limited by the permit)

A. Oxygen Demanding Pollutant: (check one) ☐ BOD ☐ COD ☐ Other:_____

			Code	*Points*
Permit Limits: (check one)	☐	< 100 lbs/day	1	0
	☐	100 to 1000 lbs/day	2	5
	☐	> 1000 to 3000 lbs/day	3	15
	☐	> 3000 lbs/day	4	20

Code Checked: NA

Points Scored: __0___

B. Total Suspended Solids (TSS)

			Code	*Points*
Permit Limits: (check one)	☐	< 100 lbs/day	1	0
	X	100 to 1000 lbs/day	2	5
	☐	> 1000 to 5000 lbs/day	3	15
	☐	> 5000 lbs/day	4	20

Code Checked: _2

Points Scored: __5___

C. Nitrogen Pollutant: (check one) ☐ Ammonia ☐ Other: _____

		Nitrogen Equivalent	*Code*	*Points*
Permit Limits: (check one)	☐	< 300 lbs/day	1	0
	☐	300 to 1000 lbs/day	2	5
	☐	> 1000 to 3000 lbs/day	3	15
	☐	> 3000 lbs/day	4	20

Code Checked: _1

Points Scored: __0___

Total Points Factor 3: __5___

FACTOR 4: Public Health Impact

Is there a public drinking water supply located within 50 miles downstream of the effluent discharge (this includes any body of water to which the receiving water is a tributary)? A public drinking water supply may include infiltration galleries, or other methods of conveyance that ultimately get water from the above referenced supply.

X YES (If yes, check toxicity potential number below)

☐ NO (If no, go to Factor 5)

Determine the *human health* toxicity potential from Appendix A. Use the same SIC code and subcategory reference as in Factor 1. (Be sure to use the human health toxicity group column ☐ check one below)

Toxicity Group	Code	Points	Toxicity Group	Code	Points	Toxicity Group	Code	Points
☐ No process waste streams	0	0	☐ 3.	3	0	X 7.	7	15
☐ 1.	1	0	☐ 4.	4	0	☐ 8.	8	20
☐ 2.	2	0	☐ 5.	5	5	☐ 9.	9	25
			☐ 6.	6	10	☐ 10.	10	30

Code Number Checked: __7___

Total Points Factor 4:__15___

FACTOR 5: Water Quality Factors

NPDES NO. VA0006254

A. Is (or will) one or more of the effluent discharge limits based on water quality factors of the receiving stream (rather than technology-based federal effluent guidelines, or technology-based state effluent guidelines), or has a wasteload allocation been assigned to the discharge:

		Code	Points
X	Yes (Temp)	1	10
☐	No	2	0

B. Is the receiving water in compliance with applicable water quality standards for pollutants that are water quality limited in the permit?

		Code	Points
X	Yes	1	0
☐	No	2	5

C. Does the effluent discharged from this facility exhibit the reasonable potential to violate water quality standards due to whole effluent toxicity?

		Code	Points
☐	Yes	1	10
X	No	2	0

Code Number Checked: A 1 B 1 C 2

Points Factor 5: A 10 + B 0 + C 0 = 10 TOTAL

FACTOR 6: Proximity to Near Coastal Waters

A. Base Score: Enter flow code here (from Factor 2): 21 *Enter the multiplication factor that corresponds to the flow code:* 0.10

Check appropriate facility HPRI Code (from PCS):

	HPRI#	*Code*	*HPRI Score*
☐	1	1	20
☐	2	2	0
☐	3	3	30
X	4	4	0
☐	5	5	20

HPRI code checked: 4

Flow Code	*Multiplication Factor*
11, 31, or 41	0.00
12, 32, or 42	0.05
13, 33, or 43	0.10
14 or 34	0.15
21 or 51	0.10
22 or 52	0.30
23 or 53	0.60
24	1.00

Base Score: (HPRI Score) 0 X (Multiplication Factor) 0.10 = 0 (TOTAL POINTS)

B. Additional Points ☐ NEP Program
For a facility that has an HPRI code of 3, does the facility discharge to one of the estuaries enrolled in the National Estuary Protection (NEP) program (see instructions) or the Chesapeake Bay?

		Code	Points
☐	Yes	1	10
X	No	2	0

C. Additional Points ☐ Great Lakes Area of Concern
For a facility that has an HPRI code of 5, does the facility discharge any of the pollutants of concern into one of the Great Lakes' 31 areas of concern (see Instructions)

		Code	Points
☐	Yes	1	10
X	No	2	0

Code Number Checked: A 4 B 2 C 2

Points Factor 6: A 0 + B 0 + C 0 = 0 TOTAL

NPDES NO. VA0006254

SCORE SUMMARY

Factor	Description	Total Points
1	Toxic Pollutant Potential	35
2	Flows/Streamflow Volume	10
3	Conventional Pollutants	5
4	Public Health Impacts	15
5	Water Quality Factors	10
6	Proximity to Near Coastal Waters	0
	TOTAL (Factors 1 through 6)	75

S1. Is the total score equal to or greater than 80? ☐ Yes (Facility is a major) X No

S2. If the answer to the above questions is no, would you like this facility to be discretionary major?

X No

☐ Yes (Add 500 points to the above score and provide reason below:

Reason:

NEW SCORE: 75

OLD SCORE: 75

Brian Wrenn
Permit Reviewer's Name

804-527-5015
Phone Number

January 20, 2016
Date

ATTACHMENT K

Owner Comments and DEQ Responses

Wrenn, Brian (DEQ)

From: Sirois, David [Siroisd@chesterfield.gov]
Sent: Thursday, March 17, 2016 4:16 PM
To: Wrenn, Brian (DEQ)
Subject: RE: Comments for VA0006254, Addison-Evans Water Production and Laboratory

Brian,

Sorry for the delay, I was awaiting your email unaware it had been filtered out by our firewall. I just found it this afternoon in the spam filter quarantine.

I have reviewed your responses to our concerns with the permit issuance documentation. We will address the parameters selected by DEQ as in need of corrective action and will provide our input as to if & how they might need to be addressed in our Corrective Action Plan (CAP) as recommended in your email below. We concur that your responses are appropriate and will begin on our CAP to be completed within 180 days from the day of the permit being issued.

Thank-you for working with us on this important permit approval process.

Dave

David J. Sirois
Plant Manager
Chesterfield County Utilities
Addison-Evans Water Production & Laboratory Facility
13400 Hull Street Road
Midlothian, VA 23112
Phone 804-318-8140
E-Mail: siroisd@chesterfield.gov

From: Wrenn, Brian (DEQ) [mailto:Brian.Wrenn@deq.virginia.gov]
Sent: Tuesday, March 15, 2016 10:58 AM
To: Sirois, David
Subject: RE: Comments for VA0006254, Addison-Evans Water Production and Laboratory

David,
I have responded below to the comments you made on the draft permit package for the Addison-Evans Water Production and Laboratory. Once you have reviewed and concurred with the responses, please respond by email, stating such. Once I have received your concurrence, I will move forward with the public notice.

Thanks,
Brian Wrenn
804-527-5015

1. The submission period for the CAP has been changed to 180 days as requested.
2. This issue can be resolved as part of the CAP submitted after issuance of the permit.
3. This issue can be resolved as part of the CAP submitted after issuance of the permit.
4. This issue can be resolved as part of the CAP submitted after issuance of the permit.
5. Comment noted.

6. Comment noted.
7. Comment noted. A key is included in the GW Data Input & Results worksheet (page 1) of each pollutant analysis under the Data Entry chart (identified as Well Designation), the Significance to Background results, and the Linear Trend Regression results. We understand that the labeling may be confusing on the charts and we will work to correct this in the future.
8. Corrected as requested.
9. Corrected as requested.

From: Sirois, David [mailto:Siroisd@chesterfield.gov]
Sent: Tuesday, March 01, 2016 3:45 PM
To: Wrenn, Brian (DEQ)
Subject: Comments for VA0006254, Addison-Evans Water Production and Laboratory

Brian,

Regarding the DEQ permit provided by email on 23 February 2016 the following comments should be considered:

1. During our verbal discussions it was indicated there would be a 180-day period from the effective date of the permit to submit a Corrective Action Plan. On page 5 of 7 in the permit requirements (Part 1, Section 5b Groundwater Monitoring – Corrective Action Plan) it states " The permittee shall submit a Corrective Action Plan (CAP) within 60 days of the effective date of the permit." In Attachment H of the permit the scope of the CAP has substantially changed since the 2011 permit approval. The 180-day deadline will be needed to examine the data trending, the corrective actions identified as warranted, investigating potential causes for parameter changes, and appropriate responses. Our verbal agreement on the timeline review of the permit was predicated on a 180-day deadline.

2. As part of the CAP we will need to investigate whether the 2011 selection of the location of the background well (MW-4) was a correct representation of background groundwater for the property. While the site MW-4 is undoubtedly upstream of the other wells, based on the 3 years of data the difference between most of the parameters in the monitoring wells and the background well MW-4 begs the question is this well significantly different from the MW monitoring wells for various reasons other than site contamination. For example, MW-4 is located on the hill created to build the man-made reservoir: are the differences in monitoring values representative of the different soils from this fill area compared to the natural flat lands soils? The site of MW-4 and its elevation does not experience the floodwaters that occasionally frequent the property, can this cause a difference? Does MW-4 experience "river bank filtration" unavailable to the other monitoring wells? (i.e. riverbank filtration is a time tested technique for purifying water first used in Europe but now used throughout the world, including some in the United States of America. The other monitoring wells may be too far from the reservoir walls to benefit from this treatment). Such reasons may explain why the original choice of MW-3 was in the flat lands of the property common to the other monitoring wells; perhaps during original evaluation of well locations these types of concerns were given more weight than in 2011 (i.e. the property looks much more congruous after years of lawn care and maintenance, the potential difference in soils is less obvious when viewing the property now than as it might have been when the wells were first located).

3. We would request a re-evaluation of the finding that pH measured from the monitoring wells warrants corrective action. As stated in the data evaluation performed by DEQ:
    a. The background well MW-4 shows a slight decrease with a moderately strong degree of linearity.
    b. The monitoring well MW-1 shows a slight increase with a very weak degree of linearity.
    c. The monitoring well MW-2 shows a slight increase with a very weak degree of linearity.
    d. The monitoring well MW-3 shows a slight decrease with a very weak degree of linearity.
    e. The monitoring well MW-5 shows a slight decrease with a very weak degree of linearity.

We would suggest the statistics show very weak trends, except for the background well. DEQ recognizes that all the data measured are within the pH standards for the Piedmont region. With the exception of the 11/13/13 values, the data for the monitoring wells (excluding the background well) range between 6.14 and 7.15 – this is a very well expected range for groundwater (and for surface water) in the Richmond area. The 11/13/13 data for the monitoring wells (excluding the background well) range between 7.11 and 8.27 was significantly higher for all of these monitoring wells, but as stated are within the acceptable Piedmont region values of being between 5.5 to 8.5. In contrast the well that most strongly shows a trend according to the DEQ analysis is the background well MW-4, which showed a decreasing trend in pH and the lowest value for MW-4 was substantially lower than the other monitoring wells at a pH of 5.59. For these reasons we feel the DEQ should reconsider their finding that the pH of the monitoring wells warrants corrective action.

4. We have some concerns regarding the statistics used to determine the need for a corrective action. When analyzing data that is less than detection there is a great deal of uncertainty regarding the actual values of such data and how these non-detect values were incorporated into the statistical calculations. For example is the true data closer to zero or to the detection limit? There are a few cases where it seems that if the laboratory detection limits were used in the statistical comparison of compliance wells versus background well, then the conclusion of a significant difference may not have been reached. Similarly, in the linear regression analysis used to evaluate data trends over time, use of detection limits instead of zeros may have led to different conclusions such as no trend or a weaker trend. It is not clear if the trends observed were evaluated for their statistical significance beyond simple qualitative statements (we're unsure how these descriptive statements are determined). Lastly, we have some concerns that a simple linear regression analysis used to evaluate trends in groundwater quality data over time could be biased by the selected monitoring interval. Would it be possible (and what degree of difficulty for DEQ would there be) to recalculate the statistics and trends using the detection limit or one-half of the laboratory detection limit instead of zero for the constituents of concern? Our intent is to concentrate resources & effort on the better defined issues and tangible work that can be performed to known constituents of concern. For the more tenuous trends and less certain parameter increases, the corrective action plan may be geared towards more data collection as may be needed before plans of remediation are designed. .

5. We understand the analyses for nutrient monitoring being added to the permit were we to discharge. Given the concerns with nutrients and Chesapeake Bay eutrophication this is understandable.

6. We concur that during this next monitoring period the emphasis should be on further data collection from monitoring well sampling.

7. In the "Addison-Evans Groundwater Monitoring Regression Trend" plots created by the DEQ there is an apparent numbering/labeling issue. The background well (MW-4), and the monitoring wells MW-1, MW-2, and MW-3 appear to be labeled/numbered correctly (i.e. Compliance Wells: Background, #1, #2, and #3). However the graph labeled as Compliance Well #4 is likely groundwater monitoring well MW-5, and the graph labeled as Compliance Well #5 appears to have no data. We suspect this may just be a software glitch, however it does make the initial evaluation of the plots confusing. Perhaps in the future if this issue arises text discussion or a key might be appropriate if the software does not allow for relabeling of the plots.

8. In the Groundwater Data Evaluation section on page 2 of 5 in the Aluminum discussion conclusion, there is an error. Currently in the Groundwater Standard text it states "Aluminum monitoring was included in the facility's approved GWMP because the facility uses aluminum sulfate (Alum) as a coagulant in the treatment process…" In the Permit fact Sheet page 2 of 12, item 12 Materials Storage is correct in listing ferric sulfate that is used as a coagulant and not listing alum as a material stored. The plant had changed coagulants from alum to ferric sulfate in 1999. The statement above could be corrected to: "Aluminum monitoring was included in the facility's approved GWMP because the facility used aluminum sulfate (Alum) as a coagulant for many years in the treatment process (1967 through 1999)…"

9. In the Groundwater Data Evaluation section on page 3 of 5 in the Sulfate discussion conclusion, there appears to be a minor typo. It states, "Because MW-3 and MW-5 concentrations exceeded the groundwater criteria for chloride, MW-3 and MW-5 showed a statistically significant difference from MW-4…". As this conclusion is based on the discussion of sulfate data, the use of the word chloride is likely an error and should be substituted with sulfate.

If at all possible, we would like to meet with you to discuss some of these concerns at your earliest convenience. Should you have any questions or concerns, feel free to contact me using my contact information provided below. Thank-you for the opportunity to comment on the permit.

Dave

David J. Sirois
Plant Manager
Chesterfield County Utilities
Addison-Evans Water Production & Laboratory Facility
13400 Hull Street Road
Midlothian, VA 23112
Phone 804-318-8140
E-Mail: siroisd@chesterfield.gov

From: Wrenn, Brian (DEQ) [mailto:Brian.Wrenn@deq.virginia.gov]
Sent: Tuesday, February 23, 2016 3:17 PM
To: Sirois, David
Subject: Owner Comment Request for VA0006254, Addison-Evans Water Production and Laboratory

David,
As we discussed earlier today, please find attached a request for owner comment letter. Due to the size of the files, I have placed the documents for review on our fileshare. I neglected to mention that we've added monitoring requirements for nutrients. These requirements are being included in all permits for non-significant dischargers to the Chesapeake Bay watershed. No limits are assigned and the monitoring is required annually and only for the first four sample periods of the permit. If you have any questions, please do not hesitate to contact me. Thanks.

Brian L. Wrenn
VPDES Technical Reviewer
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Richmond Regional

Planning District Commission

Metropolitan Planning Organization

Town of
Ashland
Counties of
Charles City
Chesterfield
Goochland
Hanover
Henrico
New Kent
Powhatan
City of
Richmond

MEMORANDUM

TO: Brian Wrenn
Department of Environmental Quality

FROM: Barbara V. Jacocks, AICP
Director of Planning

DATE: April 22, 2016

SUBJECT: **ENVIRONMENTAL REVIEW AND COMMENT**

Project Title: **Addison-Evans Water Production and Laboratory VPDES Permit**

CCN: VA15-0322-3469-015-00-041

The RRPDC received a request for comment concerning this project on March 22, 2016. RRPDC staff sent the request to staff of planning district member localities on March 29, 2016 in order to solicit comments to include in a comment letter. Any documents associated with the request were made available to locality staff. Response comments from locality staff were requested on or before close of business April 15, 2016.

RRPDC staff received no response comments from locality staffs.

RRPDC staff has no comments or concerns about this permit at this time.

Signature _____
Barbara V. Jacocks, AICP
Director of Planning

BVJ/sgs

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